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ABSTRACT

Papers presented at an August 1984 international seminar on online user education include "Library Policies and Strategies in The Netherlands" (Chris J. van Wijk, The Netherlands); "Promotion and Marketing of Library Services" (Nancy Fjallbrant, Sweden); "Library Promotion by Computer" (Ian Malley, United Kingdom); "Library User Education and Promotion of the Online Information Retrieval Service at the Vrije Universiteit Brussel" (Paul Nieuwenhuysen, Belgium); "New Developments in Information and Marketing Techniques for Science and Technology" (Shirley V. King and Pesi J. Gazder, United Kingdom); "User Education" (Blaise Cronin, United Kingdom); "Trade-Offs in the Design of an Online Public Access Catalog, Exemplified by VUBIS" (Marc O.L. Verpoorten, The Netherlands); "COBBUL: A Real Environment Experience on Automated versus Manual Catalogue Usage Education" (Domenico Bogliolo, Italy); "Library Automation: A Review of Integrated Turn-Key Systems" (Johan van Halm, The Netherlands); "Training for Online Information" (Arja-Riitta Haarala, Finland); "The User Influences (Shapes) Library Automation" (Kurt Schroder, West Germany); "Automated Catalogue and the User--Helsinki Experience" (Sinnika Koskiala, Finland); "Online Databases and Library User Education" (Lucy A. Tedd, United Kingdom); "Online Searching in a Chemistry Curriculum" (Leendert Maat, The Netherlands); "Online Library Reference Databases" (Maria Pia Carosella and Augusta Maria Paci, Italy); "The Use of the Computer in a Course of Instruction for Physical Sciences Students" (Priscilla A. Schlicke, United Kingdom); "10 Years of Turning Out Engineers for Using Scientific and Technical Information at the Compiegne University of Technology." (abstract, Liliane Vezier, France); "Changing the Face of the Subject Librarian in the Online Age in Academic Libraries" (Mark Shields, United Kingdom); "Education and Training of Students of Civil Engineering as Users of Scientific and Technical Information in the Central Technical Library of Edvard Kardelj University in Ljubljana" (Nada Cucnik-Majcen and Mara Slajpah, Yugoslavia); "Strategies for User Education for Graduate Students" (Carole Duffill, Australia); "The Role of Numerical Databases for Users" (Heinrich Behrens, West Germany); "Scientific Literature in Foreign Languages and Library Users" (Dies van Bergeijk, The Netherlands); and "Online Retrieval in Numeric Data Bases" (Josef L. Staud, West Germany). A list of seminar participants and the seminar program are also provided. (THC)

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User Education in the Online Age II

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ASSOCIATION INTERNATIONALE DES BIBLIOTHÉQUES D'UNIVERSITÉS POLYTECHNIQUES
INTERNATIONALE VEREINIGUNG DER BIBLIOTHEKEN TECHNISCHER UNIVERSITATEN
ASOCIACIÓN INTERNACIONAL DE BIBLIOTECAS DE LAS UNIVERSIDADES TECNOLÓGICAS
МЕЖДУНАРОДНОЕ ОБЪЕДИНЕНИЕ БИБЛИОТЕК ВЫСШИХ ТЕХНИЧЕСКИХ ШКОЛ

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30th July – 2nd August 1984
Delft, The Netherlands

edited by Nancy Fjällbrant

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FOREWORD

In August 1982, an international seminar on 'User Education in the Online Age' was held at Chalmers University of Technology, Gothenburg, Sweden. One of the suggestions arising from that seminar was that IATUL should arrange further meetings on this topic, as this was seen as an area where many developments would take place in the near future. The second international seminar on 'Library User Education in the Online Age' was held at Delft University of Technology, in August 1984. 24 papers were presented at this meeting, which was attended by representatives from some 14 countries. The papers presented covered the following themes:

* Library education policies and strategies
* Promotion and marketing of library services
* Library automation and the user
* Online databases and library education
* The role of numerical databases for users.

The importance of developing user education within national library policies and strategies was emphasized, together with the need to promote and market library services not only to potential users, but also to higher management.

The impact of library automation and online catalogues on users was discussed in a number of papers. User reactions to library automation appeared to be positive, as this resulted in better access to documents carrying information. The need for careful planning in the process of library automation was, however, emphasized.

User education in relation to the use of external online databases was treated by a number of authors. The costs involved in providing adequate training for end-users was pointed out and several papers dealt with strategies and methods for reducing these costs - by means of microcomputer-based systems, training aids, local databases. The final session dealt with the use of non-bibliographic databases of the traditional kind, the role and potentialities of numerical databases for users and the possibilities for obtaining information about translations of scientific and technical information.

The seminar was rounded off with a closing discussion "Education and online: Where from now?" in which the value of further seminars on this topic was stressed. The need for cooperation and exchange of ideas was seen as being particularly important. With the increasing complexity of available information services, user education is seen as being an area of library work which needs to expand beyond the traditional orientation and manual literature search into use of computerized tools for information retrieval - both public access online catalogues, and online bibliographic and non-bibliographic databases.

The participants of the seminar would like to express their thanks and appreciation to the organizing committee: Huub van de Gein, Piet Gomes, Albertine Koster, Gerard Kriek, Kees van der Meer and Hans Zandvliet, for the perfect organization of the seminar.

Nancy Fjällbrant

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"LIBRARY USER EDUCATION IN THE ONLINE AGE"

30th July - 2nd August 1984, DELFT, The Netherlands

Venue: all sessions take place in the Senaatszaal, at the first floor of the AULA building of Delft University of Technology, Mekelweg 1, Delft.

PROGRAMME

Monday 30th July

From 11.00 hours	Registration in the AULA building of the University of Technology, Mekelweg 1, Delft, first floor.
12.30 - 13.45	Lunch in the AULA building, Ballonnenzaal.
13.45 - 14.00	Coffee and tea at the Senaatszaal.
14.00 - 14.30	Opening address by Prof.dr ir B. Okkerse, Ministry of Education and Science, The Hague, The Netherlands.
Session I:	LIBRARY EDUCATION POLICIES AND STRATEGIES Chairperson: Dr J. Zandvliet, Delft University of Technology, Delft, The Netherlands.
14.30 - 15.15	Introduction - Drs C.J. van Wijk, Ministry of Education and Science, The Hague, The Netherlands.
15.15 - 15.45	Coffee and tea.
15.45 - 16.30	An introduction to Delft - R. Wagemans, Public Relation Officer, Delft.
19.00 -	Buffet sponsored by Swets & Zeitlinger, in Restaurant "Bastille", Havenstraat 3a, Delft.

Tuesday 31st July

Session II:	PROMOTION AND MARKETING OF LIBRARY SERVICES
	Chairperson: Dr T. Lidman, Delegation for Scientific and Technical Information, Stockholm, Sweden.
09.30 - 10.10 hours	Introduction - Dr N. Fjällbrant, Chalmers University of Technology, Gothenburg, Sweden.
10.10 - 10.30	Library promotion by computer - I. Malley, Loughborough University of Technology, Loughborough, U.K.
10.30 - 11.00	Coffee
11.00 - 11.20	Library user education and promotion of the online information retrieval service at the Vrije Universiteit Brussel. - Dr P. Nieuwenhuysen, Vrije Universiteit Brussel, Brussels, Belgium.
11.20 - 11.40	New developments in information and marketing techniques for science and technology - S.V. King and Dr P.J. Gazder, Science Reference Library, London, U.K.
11.40 - 12.00	User education: getting our priorities right - Dr B. Cronin, ASLIB, London, U.K.
12.30 - 13.45	Lunch, AULA building, Ballonnenzaal
13.45 - 14.00	Coffee and tea.
Session III:	LIBRARY AUTOMATION AND THE USER
	Chairperson: Kees van der Meer, Delft University of Technology, Delft, The Netherlands
14.00 - 14.45	Introduction: Trade-offs in the design of an online public access catalog, examplified by VUBIS - M.O.L. Verpoorten, Lic, Eindhoven University of Technology, Eindhoven, The Netherlands.
14.45 - 15.10	COBBUL: a real environment experience on automated versus manual catalogue usage education - Dr D. Bogliolo, University of Rome, Dept. of Mathematics, Rome, Italy.
15.10 - 15.40	Coffee and tea.

15.40 - 16.05 hours	**Library automation: a review of integrated systems -J. van Halm, J. van Halm & Information Associates, Amersfoort, The Netherlands.**
16.05 - 16.30	Training for online information - A.R. Haarala, Tampere University of Technology, Tampere, Finland.
16.30 - 16.55	The user influences (shapes) library automation - Dr K. Schröder, Kernforschungsanlage Jülich, Jülich, F.R.G.
16.55 - 17.20	Automated catalogue and the user - Dr S. Koskiala, Helsinki University of Technology, Helsinki, Finland.
17.30 - 18.30	Reception sponsored by the Executive Board of Delft University of Technology, AULA building, Ballonenzaal.

Wednesday 1st August

Session IV:	ONLINE DATABASES AND LIBRARY EDUCATION Chairperson: Dr N. Fjällbrant, Chalmers University of Technology, Gothenburg, Sweden.
9.00 - 9.40	Introduction - L.A. Tedd, Consultant, Aberystwyth, U.K.
9.40 - 10.00	Online searching in a chemistry curriculum - Dr L. Maat, Delft University of Technology, Delft, The Netherlands.
10.00 - 10.20	Online reference books databases: a new education of the library users - Dr A.M. Paci, ISRDS-CNR (National Research Council), Rome, Italy,
10.20 - 10.45	Coffee
10.45 - 11.05	The use of the computer in a course of instruction for physical sciences students - P.A. Schlicke, Robert Gordon's Institute of Technology, Aberdeen, U.K.
11.05 - 11.25	10 years of turning out engineers for using scientific and technical information at the Compiègne University of Technology - L. Vezier, Compiègne University of Technology, Compiègne Cedex, France.
11.25 - 11.45	Changing the face of the subject librarian in the online age in academic libraries - M.J.A. Shields, Leeds Polytechnic, Leeds, U.K.
11.45 - 12.05	Education of students as users of scientific and technical information - N. Majcen, Central Technical Library, Ljubljana, Yugoslavia.

12.05 - 12.25 hours	**Strategies for user education for graduate students - C.J. Duffill, Western Australian Institute of Technology, South Bentley, Western Australia.**
12.30 - 13.30	Lunch, AULA building, Ballonnenzaal.
14.00 - 14.15	Coffee and tea in the Library, Doelenstraat 101, Delft.
14.15 - 15.00	Demonstration of AUBID (DOBIS/LIBIS) in the Library.
15.00 - 15.15	Coffee and tea, guided tours through the Library.
15.45 - 16.30	Demonstration of the Dutch Union Catalogues / Interlibrary Loan system.
17.45	Departure from Juliana Hotel by bus to Amsterdam.
18.00	Departure from Motel Hoornwijck by bus to Amsterdam.
18.45	Boat trip through Amsterdam channels.
19.45 - 22.00	Meeting Dinner at the Havenrestaurant Martinn De Ruyterkade, Amsterdam (near the Central Station).
22.00	Departure by bus to Delft (Motel Hoornwijck, Station Delft, Juliana Hotel).

Thursday 2nd August

Session V:	THE ROLE OF NUMERICAL DATA BASES FOR USERS Chairperson: H.A.G.M. van de Gein, Delft University of Technology, Delft, The Netherlands.
9.30 - 10.15	Introduction - Dr H. Behrens, Fachinformationszentrum Energie, Physik, Mathematik GmbH, Karlsruhe, F.R.G.
10.15 - 10.35	Scientific literature in foreign languages and library users - D. van Bergeijk, International Translations Center, Delft, The Netherlands.
10.35 - 10.55	Online retrieval in numerical data bases: special features and examples - Dr J.L. Staud, University of Konstanz, F.R.G.
10.55 - 11.30	Coffee

11.30 - 12.15 hours	Education and online: Where from now? Closing discussion.
12.15	Closing of Meeting.
12.20	Lunch, AULA building, Ballonnenzaal.

Participants

Cécile A. Arnold
Wageningen, University of Agriculture, Wageningen, The Netherlands

Heinrich Behrens
FIZ. Energie, Physik, Mathematik GmbH, Karlsruhe-Eggenstein, F.R.G.

Dies van Bergeijk
International Translations Centre, Delft, The Netherlands

Edzard J. Boerma
Groningen University, Groningen, The Netherlands

Domenico Bogliolo
Rome University, Rome, Italy

Clemens Buijs
PICA, The Hague, The Netherlands

Michael Chaney
Loughborough University of Technology, Loughborough, U.K.

Blaise Cronin
Aslib Research & Consultancy, London, U.K.

Katherine Dimitrellou
National Hellenic Research Foundation, Athens, Greece

Monica Dorneich
Rheinisch-Westfälischen University of Technology, Aachen, F.R.G.

Carole J. Duffill
Western Australian Institute of Technology, Perth, Australia

Andrew Ettinger
London Business School, London, U.K.

Nancy Fjällbrant
Chalmers University of Technology, Göteborg, Sweden

Marianne A.G.R. Ganguli
Unilever Research, Vlaardingen, The Netherlands

Huub A.G.M. van de Gein
Delft University of Technology, Delft, The Netherlands

Piet M. Gomes
Delft University of Technology, Delft, The Netherlands

Cora Gravesteijn
Netherlands Library Council, The Hague, The Netherlands

Arja-Riitta Haarala
Tampere University of Technology, Tampere, Finland

Johan van Halm
Johan van Halm & Information Associates, Amersfoort, The Netherlands

Tamar Harari
Tel-Aviv University, Library of Science & Engineering, Tel-Aviv, Israel

Yvonne Harding
Inner London Education Authority, London, U.K.

Elisabeth Kihlén
Chalmers University of Technology, Göteborg, Sweden

Jacques de Kimpe
Free University Brussels, Brussels, Belgium

Shirley V. King
Science Reference Library, London, U.K.

Cees A.G. Konings
Delft University of Technology, Delft, The Netherlands

Sinikka Koskiala
Helsinki University of Technology, Espoo, Finland

Albertine Koster
Delft University of Technology, Delft, The Netherlands

Gerard Kriek
Delft University of Technology, Delft, The Netherlands

Ann-Mari Langegård
Chalmers University of Technology, Göteborg, Sweden

Tomas Lidman
Delegation for Scientific and Technical Information (DFI), Stockholm, Sweden

Staffan Lööf
University College of Borås, Borås, Sweden

Leendert Maat
Delft University of Technology, Delft, The Netherlands

Nada Čučnik-Majcen
Central Technical Library, Ljubljana, Yugoslavia

Ian Malley
Loughborough University of Technology, Loughborough, U.K.

Kees van der Meer
Delft University of Technology, Delft, The Netherlands

Theodore Melachrinidies
National Hellenic, Research Foundation, Athens, Greece

Steve E.J.H. Mertens
Unilever Research, Vlaardingen, The Netherlands

Alexander Nevyjel
Austrian Research Center Seibersdorf GmbH, Vienna, Austria

Paul Nieuwenhuysen
Free University Brussels, Brussels, Belgium

Wendy Ogilvie-Parfrey
Elsevier - NDU, Amsterdam, The Netherlands

Boudewyn Okkerse
Ministry of Education and Science, The Hague, The Netherlands

Chris Oldenhof
Gist-Brocades, Delft, The Netherlands

Augusta Maria Paci
ISRDS-CNR, Rome, Italy

Bill Renaud
NOBIN, The Hague, The Netherlands

Hugo M. Rietveld
ECN, Petten, The Netherlands

Priscilla A. Schlicke
School of Librarianship and Information Studies, Robert Gordon's Institute of Technology, Aberdeen, U.K.

Kurt Schröder
Nuclear Research Centre Jülich, Jülich, F.R.G.

Mark J.A. Shields
Leeds Polytechnic Library, Leeds, U.K.

Paul Snijder
Erasmus University Library, Rotterdam, The Netherlands

Elvia Sosa-Esquivel
University of Sheffield, Sheffield, U.K.

Josef L. Staud
University of Konstanz, Konstanz, F.R.G.

Jo H.G. Sterk
Eindhoven University of Technology, Eindhoven, The Netherlands

Lucy A. Tedd
Aberystwyth, U.K.

Knut Thalberg
University of Trondheim, Trondheim, Norway

Pieter Vellekoop
Gist-Brocades, Delft, The Netherlands

Marc O.L. Verpoorten
Eindhoven University of Technology, Eindhoven, The Netherlands

Liliane Vezier
University of Technology of Compiègne, Compiègne, France

Marie José Vlaanderen
Erasmus University Library, Rotterdam, The Netherlands

Hanna L. de Vries
Leiden University, Leiden, The Netherlands

Chris J. van Wijk
Ministry of Education and Science, The Hague, The Netherlands

Hans Zandvliet
Delft University of Technology, Delft, The Netherlands

OPENING ADDRESS

Boudewyn Okkerse

Deputy Director General,
Ministry of Education and Science, The Hague, The Netherlands

It gives me great pleasure to open this Conference of the International Association of Technological University Libraries in Delft on behalf of the Minister of Education and Science. I was happy to accept the Conference Committee's invitation, not only because of my old ties with the Technological University, where I studied and spent a decade engaged in teaching and research, but mainly because of the theme of the Conference. It gives me the opportunity to outline to an international audience a number of plans recently formulated by the Netherlands Government.

The provision of information by libraries and documentation centres was for a long time outside the policy-makers' real sphere of interest. This can partly be explained by a failure on the part of the government to see what was going on - it took the first Sputnik launching to alert them to reality - and partly by the kind of people attracted to working in information services. They tend to work in a serious and painstaking fashion and to shun the limelight.

Nowadays of course there is considerable interest in the subject. It could even be said that the period of neglect has been followed by one of wild enthusiasm. Governments in all Western countries are now issuing lofty policy statements on the 'information society'. But, as is often the case with fashionable slogans, the term is not altogether accurate.

Of course the term 'information society' covers much more than just libraries and documentation services. As far as manpower is concerned, they represent roughly 10 % of the jobs in this rapidly expanding sector. Your particular field is nevertheless a part of it and if librarians and documentalists are able to accept the challenge, they will benefit from the expansion of what has been called the information industry.

The healthy development of information services in a particular country is dependent on the political and economic climate and on the infrastructure, which may aid or impede their progress. I should like to discuss in this introduction a number of recent political developments in the Netherlands. I will leave changes in the infrastructure to the experts who will be addressing you during the next few days.

Before discussing these developments, I want to outline some of the significant features of information services in this country. Their two principal characteristics are decentralisation and voluntary cooperation.

A number of West European countries have opted for a centralized approach, as evidenced by the dominant role assigned to a particular library. You can no doubt think of several examples. In the Netherlands, however, we have tended to seek the answer in collaboration between libraries and documentation centres. As typical examples I should like to mention: firstly the three central catalogues run by the Royal Library at The Hague and the libraries of Delft Technological University and the Agricultural University at Wageningen, through which inter-library lending takes place; secondly, the Joint Computerised Cataloguing system for books and periodicals; and finally the production of Dutch bibliographic materials by the Netherlands Bibliographic Centre, in which seven organisations involved in the book trade, publishing and libraries collaborate with the State.

The position of the Royal Library in The Hague, which was designated as National Library on 7 September 1982, does not conflict with the characteristics I referred to earlier: it plays a prominent but not a dominating role in the field of information in the Netherlands.

I now come to the role of the government. This can be summarized as follows: firstly, to provide an effective advisory system and secondly to take the initiative in fields such as legislation, standards, research and development, education and training, the promotion and, where necessary, financing of promising ideas (known as 'pump-priming') and representation at international level. Society today is characterized by rapid change in numerous fields. Its manifestations include political changes, economic insecurity, social unrest, changing patterns of employment and rapid technological advances. It is the government's responsibility to create a suitable climate and to establish or adjust the political instruments needed to deal sensibly with these changes. Technical developments in the field of computers and telecommunications are a principal cause of shifts in tasks and responsibilities with regard to the collection and distrubution of information. At the same time, however, they make it possible to control this process more effectively.

Aware of its duty to act as guide amidst these changes, the government analysed the problems and sought a framework within which the supply, distribution and demand for information, and the library system could each be done justice. In March 1984, the government published its plans for such a framework, which may be summarized as follows:

There is to be one central body responsible for advising the government on matters concerning the library system (including public, academic and special libraries, and government libraries and documentation services) and the provision of information to all professions, including science and engineering. This body, the Library and Information Services Advisory Council, may also advise organisations in industry, government and other sectors of society on matters pertaining to its field of reference. Furthermore, it must pay specific attention to the use of information technology in libraries and documentation services. The Council will have a limited number of members - probably seven - who will be recruited from among producers, administrators, distributors and users of information at management level. They will act in a purely personal capacity. The range of expertise and background of the members must be such that the social, cultural, educational, scientific, economic, commercial, industrial and professional objectives of information can be promoted in a balanced manner by the Council. Like the Library Council now, the Advisory Council will have a secretariat.

At the beginning of the transition period (preceding the legislation required to set up the Advisory Council) a Netherlands Library and Information Services Institute will be established.

The Institute's responsibilities will consist of promotion, pump-priming and where necessary coordination. It will have an administrative board consisting of five members who will be recruited from similar circles to those on the Council. The functions of the Institute can for the moment be briefly described as follows:

One: to initiate improvements in the information and library infrastructure.

Two: to promote the efficient and effective use of databases and databanks by professional users in government, industry, research institutes and educational institutions.

Three: to encourage the establishment of new facilities, making particular use of the opportunities offered by new information techniques.

Four: to promote appropriate training for professional staff in libraries and information services, and to educate and inform users.

Five: to study new methods and techniques which can be applied in all stages of the information process.

Six: to provide temporary accommodation for new or existing organisations until these are able to stand on their own feet or find a permanent home in another institution.

The Institute should not itself carry out information or library activities on a permanent basis.

No public servants may sit on either body and both institutions are subject to 'sunset laws' - an innovation in the Dutch legal system imported from the United States. This means that in the case of the Advisory Council and the Institute, the Acts establishing them will be dissolved after a period of ten years unless the ministers concerned decide to prolong their life, at the latest two years before the ten-year period is up.

At the same time as these plans were published, the ministers concerned proposed a solution to an issue which has concerned Dutch information circles for many years, namely that of a National Information Agency, like the On-line Information Centre in a number of West European Countries. The government favours an independent, commercial information centre which would act as middleman between users and host computer organisations and for the present it does not envisage a national agency set up and permanently subsidised by the State.

Reactions to the plans have been received from many quarters. There has been broad support for the creation of an Advisory Council and a Library and Information Services Institute. As far as the Information Centre is concerned, six interested parties from industry have made themselves known and it has been agreed that they will submit their proposals for setting up and operating such a centre by 1 October 1984.

The government's proposals will now be implemented in the coming months. A Steering Committee, consisting of representatives of the responsible ministries and the authorities involved in the reorganisation, will soon begin to draft a plan to cover organisation, financing and the staff required. The government has emphasized its desire that the staff of the three bodies involved in the plans - the Library Council, the Netherlands Organisation for Information Policy (NOBIN) and Cobidoc - who carry out their work with great application and ardour, should receive opportunities within the new set-up for developing activities which will benefit the Dutch information infrastructure as a whole. It is intended that the Steering Committee will issue a report by 1 December 1984 so that the ministers concerned can finally approve the plan at the beginning of 1985. It would thus appear that a debate which has gone on far too long can finally be concluded and that a solution has been found which has broad support.

I am well aware that the government plans I have just outlined relate to only one of the facets of the information infrastructure, albeit an important one. Many other aspects will be dealt with in this conference over the next few days by experts who will, I have no doubt, provide you with plenty of material for discussion. On behalf of the Minister of Education and Science I wish you a successful conference and a productive exchange of views.

LIBRARY POLICIES AND STRATEGIES IN THE NETHERLANDS

Chris J. van Wijk

Ministry of Education and Science, The Hague, The Netherlands

Abstract

Information nowadays has been declared an important subject, that has attracted the attention of policymakers.

The automation is now applied on a large scale in the Dutch libraries. Firstly some developments are sketched, for example the shared automated cataloguing system, the automated national central catalogues, the automated Interlibrary Lending and the role of the libraries with special tasks.

In the second part the different types of library education and training are discussed. The proposed restructuring of the Library and Documentation Schools gets extensive attention.

The cooperation in the field of on-line training, which is restricted to the use of hardware at joint expense, could be followed by other forms of cooperation, for instance the design of new forms of education adjusted to the requirements claimed by the technical developments and the application of automation in the field of library and information.

I. Introduction

Government circles all over the world now recognise that information is an article of major significance. Every self-respecting minister will mention it at least once or twice in every address. This turns librarians, the key figures in the provision of information, into very important people. They have even become principal characters in famous works of literature. The best known case from recent European literature is undoubtedly the librarian of the abbey described by Umberto Eco in his recent novel "The Name of the Rose". This learned reverend, member of your calling, casts, however, a strange light on the profession of librarianship. Assuming that you have not read this fascinating book - remembering the dictum "a librarian who reads is lost" by a former deputy librarian of the Netherlands Royal Library - I quote: "You see, Brother William," the abbot said, "to achieve the immense and holy task that enriches those walls, devout men have toiled for centuries, observing iron rules. The library was laid out on a plan which has remained obscure to all over the centuries and which none of the monks is called upon to know. Only the librarian has received the secret, from the librarian who preceded him, and he communicates it, while still alive, to the assistant librarian...Only the librarian has the right to move through the labyrinth of books, he alone knows where to find them and where to replace them, he alone is responsible for their safekeeping. The other monks work in the scriptorium and may know the list of volumes that the library houses...only the librarian decides how, when, and whether to give a book to the monk who requests it." Those were the days, I hear you say. But the book is set 650 years ago.

As the title of my remarks indicates, I intend to turn my attention to more recent events for the rest of the time allowed me. I should like to begin by explaining the position of some of the information services in the Netherlands and a few recent developments, with particular emphasis on the situation in the universities, and then say a few words about training for workers in the information field in the Netherlands.

II. Themes in information services in the Netherlands

IIa. The "Division of labour and specialisation" operation and University libraries

Universities in the Netherlands, as in many other countries, have been instructed by the Government to economise. The process is known as "division of labour and specialisation", and is designed to ensure that each university individually, and the university system as a whole, carries out its responsibilities more efficiently. University libraries have not escaped these economies.

The Dutch Library Council was asked for advice on the best way of maintaining university information services at the required standard. The Council pointed out ways of saving money by bringing to light the flows of funds behind the various collections in one and the same institution and by placing all these different information facilities within the institution under the librarians' control. This would help to prevent duplication of local collections, which is of particular importance with respect to expensive subscriptions to periodicals, and would also enable a correct assessment to be made of the need to purchase multiple copies of a particular work for different groups of readers. Computerizing the catalogues would give readers access to all the collections.

The Council also recommended that savings could be made by concentrating collections in larger units than is often the case at present. Such an improvement in efficiency can, however, only be achieved in the long term, provided in the short term investments are made in standardizing and computerizing local library procedures, and provided the effects at inter-university level are taken into account, for, after all, university libraries form a part of the national library network. That is why coordination is necessary in building up collections and cooperation is required with regard to inter-library loans at national level. The Council suggested that each library should draw up an annual plan which should take into account national forms of coordination and cooperation in these areas. The report was endorsed by the Minister of Education and Science and was sent to the universities in December 1983. It is now up to the universities to implement its proposals.

IIb. Joint Computerized Cataloguing System

The idea of "shared cataloguing", which originated in the United States in the 1960s, has been adopted in the Netherlands in the form of the Joint Computerized Cataloguing System, under which a title of a book has only to be catalogued once, and is then freely available without charge to all the participating libraries. At present the Royal Library at The Hague and six of the university libraries participate in this system, and three other university libraries - Utrecht and the two Amsterdam universities - are well on their way to joining it. It is expected that Utrecht's computer will be linked to that of the Joint System in 1984. A grant has been promised by the Minister of Education and Science for the purchase of the necessary hardware and the development of the software. The library of the Free University of Amsterdam - a private University of one of the Protestant denominations - will shortly join the system. The library of the University of Amsterdam has been partly linked to the system since late in 1983, and can now consult the catalogues on line in return for payment and can transfer catalogue entries to its own catalogues.

For historical reasons the libraries of the three universities of technology do not participate in the system.

The Joint Computerized Catalogue System is attracting an increasing number of users beyond the universities. These include special libraries, such as those of the International Court of Justice at The Hague, the Central Bureau of Statistics and the inter-university Institute of Legal History and Documentation. A number of the major public libraries are directly linked to the system and the rest of the public libraries use it through the link of the Dutch Centre for Public Libraries and Literature at The Hague.

Discussions are being held with the Open University, which is now starting up in the Netherlands, concerning special facilities if the Open University decides to join the system; these will be required because of the University's regional study centres.

In 1983 a total of 607,412 works were catalogued using the system. In the same year the number of entries in the system rose to 2,139,475, which can be regarded as among the highest in the world.

To handle the increasing number of daily transactions, and the expected rise to 500 terminals by 1989, a TANDEM NONSTOP TXP computer system has been ordered to replace the DEC PDP 11/70 system currently in use. Since the increasing number of terminals and the growing workload impose high standards of data communication, efforts are being made to link the entire network to the universities' central computer by 1985 on the basis of the X 25 protocol. A study is also being made to see if terminals can be linked up via the Dutch Post Office DATANET 1 packet switching network.

Apart from a common cataloguing system, work is also being carried out to devise a common uniform subject classification system and a system for documentary information which will contain input and thesaurus facilities and an on-line retrieval system. The thesaurus is based on a facility enabling a local key word thesaurus to be built up and used. A simple retrieval facility is at present under development, and will later be extended to enable users to employ advanced search strategies using the Common Command Language.

Card catalogues are now a thing of the past, and microfiche catalogues represent a transitional stage. The on-line catalogue, for use by ordinary readers or end users, has been centrally developed and is being tested in the Royal Library at The Hague and Groningen University Library. Following these trials, it will be introduced into those libraries using the joint system which have a local minicomputer of the DEC PDP 11/44 type (Leiden, Rotterdam and Tilburg). They in turn will conduct more trials on the computerized shelving, loan and accessions systems which have also been developed. Software is being developed which will transfer data from the joint cataloguing system by telephone to local minicomputers, where it is needed, among other things, for up-dating the on-line catalogues for the public.

Local computerization of library procedures is a significant step towards the integration into a unified whole of the decentralized library facilities in the universities. Accordingly, the Ministry of Education and Science is prepared to give enthusiastic encouragement to such computerization.

IIc. The National Central or Union Catalogues (NCC) and Computerized Inter-Library Loans (ILL)

With encouragement and financial assistance from the Ministry of Education and Science a system came into operation in 1983 allowing the three libraries which keep central or union catalogues (the Royal Library at The Hague and the libraries of the University of Delft and the Agricultural University of Wageningen) to link their decentralized in-house systems to a joint computerized system, thus enabling readers to find the books they want immediately and request them automatically. At present there are 74 libraries linked to this system, including most of the research libraries and a number of special libraries, such as major company libraries and the libraries of certain government Ministries. Preparations are being made for more libraries to join the system.

In 1983 the titles of the periodicals in the catalogues of the three libraries - some 180,940 in all - were entered into the National Union Catalogues database. This year the titles of all monographs will be added. The Minister of Education and Science has promised a grant until 1987, which can be used by the three libraries with union catalogues to ensure the success of the system by accustoming the participating libraries to a computerized interlibrary loan system. In other words, while the costs of consultation will be shown, libraries which at present cannot cover these costs and would therefore otherwise have to refrain from taking part, will nevertheless be able to continue to use the National Union Catalogues until 1987. Within this period the three libraries I referred to earlier will have to make the National Union Catalogues system pay its way.

When the grant runs out in 1988, it is intended that the consultation costs of the National Union Catalogues, which by that time will be integrated into the inter-library loan system, will be charged in their entirety to the user libraries. Lending to other libraries involves other costs as well, for carriage and staff time. When the national inter-library loan system was computerized, it became clear that it was not - or at least was no longer - operating on a basis of reciprocal cost-sharing. Now that all libraries are facing dwindling resources, we must ensure that their own dedication and the service they provide to third parties via the inter-library loan system are not reduced. At national level, the only way to meet readers' requirements is to coordinate the acquisition of works by the libraries and to provide a very smooth-running inter-library loan service. It is not yet clear whether the only way to achieve this is to pass on the costs to the individual reader. The Dutch Library Council is investigating this question and preparing a report on it.

I should like to close my remarks on this subject by pointing out that, as a side effect of the National Union Catalogues, a national database will be created containing details of all books and periodicals ordered. This in turn will assist the national coordination of libraries' acquisitions.

IId. Centralized special libraries and national harmonization of collections

It is not possible for the university libraries to meet the demand for books and periodicals on their present budgets. Unlike the United Kingdom, with its British Library Lending Division, however, the Netherlands has not opted for centralization as a solution, but has preferred to build upon the existing situation by means of a decentralized approach.

One aspect of this is the union catalogue system, which has been in operation for many years; another is the system developed in recent years of libraries of a special kind which are responsible for the acquisition of literature of a specific science. For technology the central library is at Delft University of Technology, for natural science and medicine at the Royal Netherlands Academy of Arts and Sciences at Amsterdam, for the humanities it is the Royal Library at The Hague and for agricultural science the Agricultural University Library at Wageningen.

The idea behind these specialized libraries is that they acquire specific academic literature which cannot be found anywhere in the Netherlands, but which is considered to be of such importance that it has to be available in at least one place. Their collections therefore supplement the basic university collections.

Delft University Library and that of the Royal Netherlands Academy receive an extra grant for this purpose. Agreement has been reached between the three Dutch universities of Technology on how the Delft grant is to be spent. To decide on what biomedical literature should be acquired for the Academy library, a committee is being set up whose judgement can be considered by the Dutch libraries possessing significant biomedical collections as representative, expert and independent.

IIe. Grey literature

A number of steps have been taken in recent years with regard to the acquisition of documents which are not available through normal commercial channels. The libraries of Delft University of Technology, the Royal Netherlands Academy of Arts and Sciences, the Agricultural University together with the Centre for Agricultural Publishing and Documentation (PUDOC) in Wageningen and a number of other research institutions have set up a joint plan of action with regard to such material, notably reports produced in the Netherlands, which includes agreements on their acquisition.

These libraries forward the reports to the relevant libraries participating in the plan. As a result, the number of reports published in the Netherlands which are retrievable in international databases is gradually increasing. The cataloguing and classification of this material is at present done partly by the National Technical Information Service (NTIS) and the National Aeronautic and Space Agency (NASA) in the United States, with which agreements have been concluded, and partly in the Netherlands. Several hundred reports were processed in 1982 and over a thousand in 1983. It is predicted that the figure will eventually reach around 5,000 per annum.

The collections of Dutch and foreign reports built up as a result of these efforts are being made available for loan to Dutch readers.

III. Training

IIIa. Introduction

At the moment there are three organisations providing training courses in the Netherlands,

1) the Library and Documentation Schools,
2) the Library Science Department at the University of Amsterdam,
3) the training centre for business records, library, documentation and data processing.

I will give a brief overview of them.

IIIb. The Library and Documentation Schools

There are at present six Library and Documentation Schools in the Netherlands, all providing a number of full-time training courses at higher vocational level. These are divided into a two-year basic course attended by some 1,500 students and six different advanced courses attended by 400 to 500 students. The advanced courses take one year and include a three to six week period of on-the-job training. The advanced courses lead to qualifications as librarian/documentalist, or as assistant in an academic library, public library, children's library, music/record library or school library. Not all the Schools offer the advanced courses.

Since 1977 there have also been part-time courses leading to qualification as a public librarian at three Schools.

IIIc. Training as Academic Librarian

This course is given at the University of Amsterdam by the Library Science Department, which is part of the Faculty of Letters, but is intended for graduates in all subjects from all faculties throughout the country. Its location in an Arts Faculty can be explained by its history: the founders of the course at the beginning of the sixties came from the Royal Library and the university libraries, which are mainly concerned with the humanities. It was with the greatest difficulty that the course finally managed to lose its purely Arts image.

The course is at present divided into two streams: the A stream covers the history of books and printing and the study of manuscripts, while the B stream is mainly concerned with library management, documentary information, cataloguing and classification and on-line information retrieval.

In principle the course is full-time and takes one year, although if so desired it may be taken part-time as a two-year course. It is not intended that the course should become an independent first tier field of study with its own examinations. It will remain a post-graduate course.

There are now, however, two one-year part-time courses, one in Bibliology and Library Studies, the other in Library Information Sciences, which can be taken as an optional, subsidiary subject by undergraduates reading for a "doctoraal" degree in any faculty in the Dutch university system.

IIId. The Records, Library, Documentation and Data-processing Training Centre

The Centre was founded in 1950 as a joint venture on the part of a number of professional associations for people working in libraries, business records and filing departments and documentation centres.

In addition to a number of correspondence courses in Universal Decimal Classification, and the cataloguing and arrangement of archive and library material, the Centre also organises a number of part-time courses. These are: a special library basic training course (one year); an academic library basic training course intended for middle-ranking library staff (one year); the business records and filing course; the literature search course intended for staff responsible for the provision of information by means of selection, compiling new accession lists, analysis, cataloguing, classification of material and the drafting of reports and finally the Advanced Library Course which is intended for managerial staff in special libraries or senior staff in university libraries.

The Centre does not receive a grant from the Ministry of Education and Science or any other government body. Unlike the Library and Documentation Schools and the training course for academic librarians, therefore, it does not have to comply with the requirements laid down by the Ministry of Education and Science. The courses are closely geared to actual job content, unlike the broadly vocational training offered by the Library and Documentation Schools. Since the part-time courses are given by part-time teachers who are employed in libraries, documentation centres and company records departments, the Centre's work is closely allied to the profession itself.

IIIe. Training in the Provision of Information via Networking (SOVIN)

In 1980 the three training organisations I have described joined forces with a number of bodies concerned with the provision of information and agreed to provide accommodation for holding on-line retrieval courses.

The Ministry of Education and Science was greatly in favour of such on-line courses and provided a grant. In this way the Library and Documentation Schools and the Library Science Department at the University of Amsterdam were able to update their courses by providing lessons in on-line retrieval much more quickly than if they had been subject to the normal regulations governing financing to schools.

At present there is central training accommodation in Utrecht. If necessary, use is occasionally made of a larger library, such as that of Delft University of Technology or the Royal Netherlands Academy of Arts and Sciences at Amsterdam.

The Library and Documentation Schools have since obtained a grant from the Ministry of Education and Science so that they can provide training in on-line literature searching and cataloguing in the coming academic year using their own computer. This creates a problem for the other participants since the largest user in the group (the Schools accounted for 50% of the centre's time) is now about to drop out. They are now looking for ways to continue.

IIIf. Restructuring the training

I spoke earlier of rapid technological progress and the increasing use of computers in information services. These factors have created an urgent need for in-service training in the information services and have also made it necessary to revise thoroughly initial training courses.

In June 1983, the Netherlands Organization for Information Policy (NOBIN) published a report containing proposals on training. In fact it described the function of information provider and the training requirements deriving from it which, in the future, everyone whose profession it is to provide information to government, industry or the academic world will have to fulfil. This can now serve as a basis for more detailed studies concerning the structure and curricula of the training courses concerned, which the report itself did not undertake.

At almost the same time, the Library and Documentation Schools published a report containing proposals for the restructuring of their training courses. Developments in the field of information services and criticism of training facilities from within the profession have made it necessary to review the courses offered by the Library and Documentation Schools. From May 1982 to mid-1983 a committee worked on recommendations for the restructuring of the training course. Proposals were also made in connection with the new Higher Vocational Education Act, which is at present before Parliament, to create a two-tier system. It was suggested that the first tier should consist of a single four-year course designed to prepare students for all types of library. There would, however, be a number of options from which students would choose in the second year or at the beginning of the third. These would include special and university libraries, cataloguing and classification and documentation.

Three courses were proposed for the second tier:

a) Library-manager for specific types of library,
b) subject specialist/librarian,
c) librarian/teacher.

The committee based its recommendations with regard to course content on what it saw as the core responsibilities of the profession, that is, firstly, to mediate for the user and, secondly, to organize library services effectively and efficiently. The choice of the former as primary duty, with the recommendation that the ideas of the British library school teacher C. D. Needham be applied, has an influence on the form and content of the teaching. The core of the curriculum must therefore be practice within the School and work experience outside. The proposals provide for 30 such periods, each lasting a week, spread over the four years.

The Minister of Education and Science gave his response to the report in May this year. He considered the request that the length of the course be extended to four years a reasonable one, but was unable to approve it in view of the considerable financial consequences it would entail. According to established policy, the first tier of higher vocational education must not be specifically geared to particular jobs, but be broadly based, since this increases the range of job opportunities open to its graduates. He would therefore prefer a single course lasting three years with a number of options for the final examinations which would cover the various professional specializations.

For the present, the Minister does not wish to approve any detailed plans for the second tier and will consider the proposals on this subject only after the Higher Vocational Education Act has been finalized.

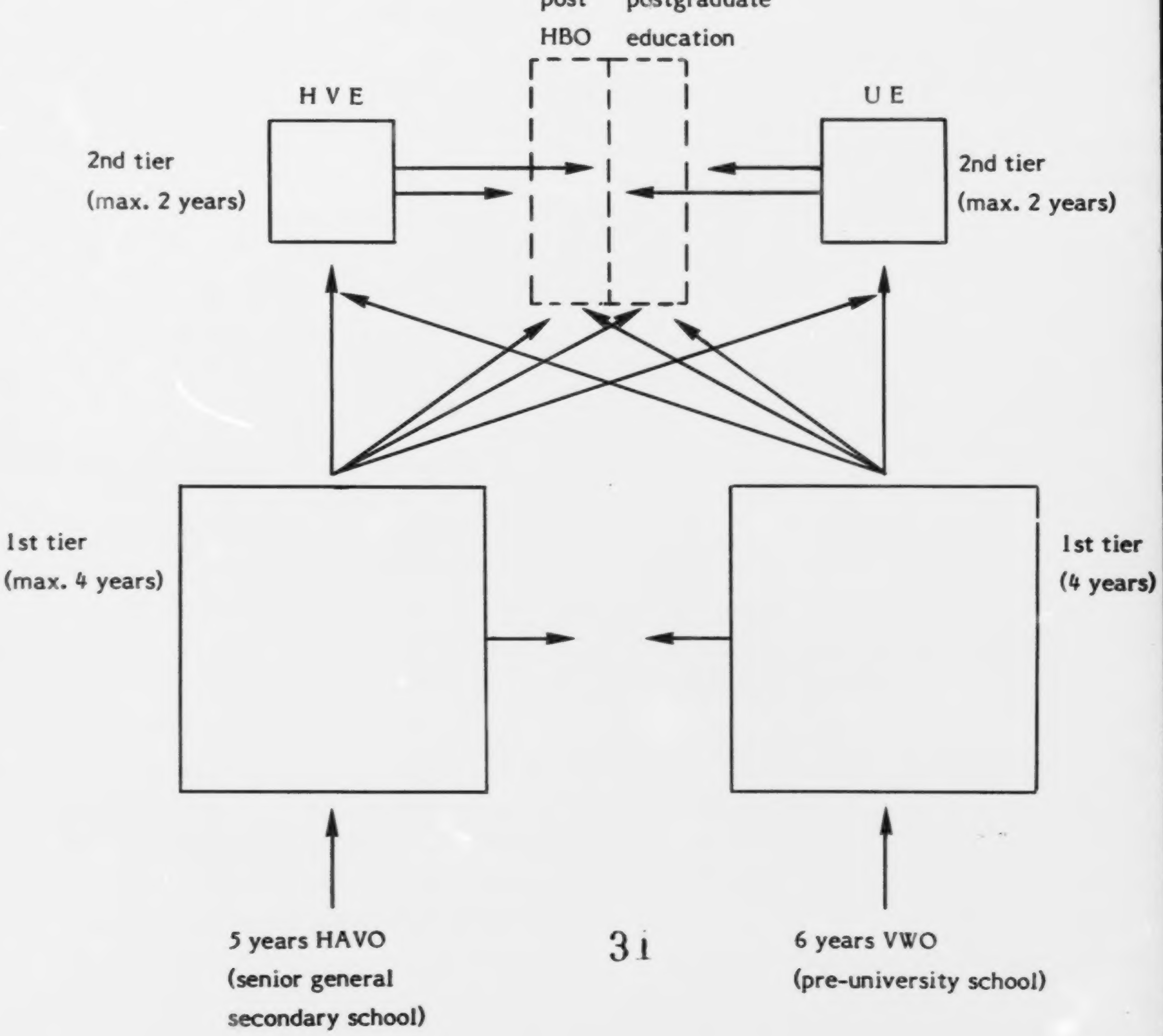
As you can imagine, the Library and Documentation Schools are not entirely happy with the Minister's response. However, they are at present working on a curriculum for a single three-year course.

Conclusion

This concludes my general review of training in the Netherlands, although some forms of training have received more emphasis than others. It will be interesting to see whether other types of joint venture will materialize, in addition to that in the field of computer use. The report on the restructuring of the training courses given by the Library and Documentation Schools is perhaps a step in the direction of such ventures, particularly in what we call the second tier. It indicates exactly where the Schools, the Library Science Department of the University of Amsterdam and the Records, Library, Documentation and Data-processing Training Centre could collaborate on developing and setting up new training courses, either on their own initiative or compelled by hard times. Such collaboration would also provide an excellent basis for improving research in this country in the field of information services. According to a report recently published by the Fact-finding Committee on Information Research, research in the Netherlands is limited and fragmented and does not keep pace with new technological developments.

The policy of the Ministry of Education and Science, as recently outlined in a number of policy documents, takes all these factors into account. Nevertheless, as you will realise from the Minister's response to the report on restructuring of the Library and Documentation Schools, the Ministry cannot always translate general policy statements into concrete action and is sometimes held back by financial considerations.

Below is a schematic representation of the structure of Higher Vocational Education (HBO). For the sake of comparison, the new University Education (WO) structure is also given and an indication of the relationship between the two systems.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HBO
postgraduate
education
H V E
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(max. 2 years)
2nd tier
(max. 2 years)
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(max. 4 years)
1st tier
(4 years)
5 years HAVO
(senior general
secondary school)
6 years VWO
(pre-university school)

YOU have helped build
EUROPE'S PLACE in SPACE . . .
. . . you are entitled to take
advantage of technological
know-how acquired through
years of research and
development!

YOU have also helped build
EUROPE'S PLACE IN ONLINE
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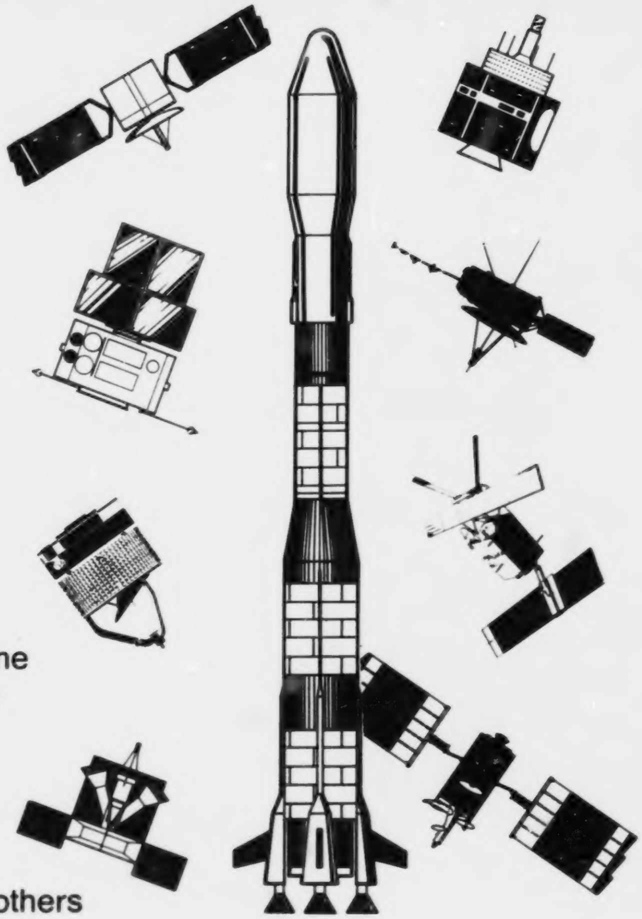
with a service badly needed.
Due to its R&D orientation in
the context of the Agency's
mandate, ESA-IRS is already
operating in the future – where others
just reached the present!



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PROMOTION AND MARKETING OF LIBRARY SERVICES

Nancy Fjällbrant

Chalmers University of Technology, Gothenburg, Sweden

Abstract

A modern university of technology library is an extensive and expensive information resource. It is important that potential users should be aware of the sources and resources available - both within the library itself and worldwide via online information retrieval and document delivery systems.

This paper examines the target groups for library promotion. Methods of marketing and promotion, both within the organization and for external users, are discussed.

User education can be an effective method for this function. The relationship of user education to online information retrieval is traced and possible developments discussed.

A particularly important area is the promotion and marketing of the library and its resources to administrative planners and decision makers. The following question is considered - "To what extent can user education be used as a library promotion tool for top administrators both within and without the organization?". This question is linked to the provision of funding, not only for the education programme, but for the library as a whole.

Introduction

A modern university of technology library is a vast information resource. Not only does it contain a considerable amount of documents stored on the premises, but it also provides a gateway to worldwide knowledge by means of online information retrieval services and document delivery systems. The university library is, furthermore, a fairly expensive organization often costing a considerable portion of the university's budget. It would, therefore, seem reasonable that this extensive and expensive information resource should be used by as many people as possible, and this calls for promotion and marketing. User education is one way in which this can be achieved.

Libraries are non-profit making organizations, which strive to meet social 'needs'. Other examples of this type of organization are universities, colleges and schools, hospitals, symphony orchestras and museums. These kinds of institutions are, at present, in many countries suffering from reductions in public expenditure and at the same time rising costs both for material and staff. If libraries are to survive it will be necessary to critically examine traditional approaches to service, and to be flexible responsive and ready to move into new areas. User education, online information retrieval and document delivery, and marketing or "customer satisfaction engineering" (Ref. 1) are all relatively new library functions. This paper will attempt to trace some of the relationships between them.

What is marketing?

What do we mean by marketing? The American Marketing Association has the following definition:

> "Marketing is the performance of business activities that direct the flow of goods and services from producer to consumer or user" (Ref. 2)

Another definition is:

> "Marketing is getting the right goods and services, to the right people, at the right place, at the right price, with the right communication and promotion."

Kotler (1980) proposed the following:

> "Marketing is a human activity directed at satisfying needs and wants through exchange processes."
>
> "Marketing can be regarded as a process whereby two parties freely give something of value to one another to satisfy some of their needs and wants" (Ref. 3)

In terms of the library both products - documents, audio-visual materials etc. and services - information given at the reference desk, constitute possible exchanges. We provide more than this - knowledge about methods of communication and how to obtain information.

As Gee expressed this in relation to information service organizations:

> "What we are promoting is trained mental attributes - and we must not be confused by the physical formal of our endeavours, whether we are producing abstracts, indexes, bibliographies, current awareness services, or solutions to direct queries" (Ref. 4)

A basic text book on marketing for non-profit organizations is that of Kotler (1979) (Ref. 5). Two texts that are directed specifically towards librarians and information workers are Yorke's introduction to the marketing of the public library service "Marketing the Library Service" (Ref. 6) and the Aslib Reader "The Marketing of Library and Information Services" edited by Blaise Cronin. (Ref. 7) The latter book is a collection of papers on 6 themes: Principles and practice of marketing, The application of marketing principles to the management of library and information services, Marketing practice, Marketing research, Marketing communication, Cooperation and coordination.

Marketing can be based on a few fundamental questions:

1. What are the objectives of the organization?
2. Who are the potential users?
3. What are the information gathering habits and needs of these users?
4. What are the benefits to be derived by the users?

5. What is the expected volume of demand?
6. Do we wish to focus on certain groups?
7. Who or what is the competition?
8. Which methods and media to use?
9. How did it work?

Marketing involves the whole process - setting objectives, carrying out studies of user information gathering habits and needs, concentration of the products or services followed by their promotion. Ideally this promotion should be followed by some form of evaluation. What effect has the programme had on user satisfaction, and use of the library? How has this affected library funding, and job satisfaction?

This marketing process closely resembles the stages in the development of a library user education course or programme

1) Study of the information gathering habits and needs
2) Selection of target group for education
3) Assessment of potential demand
4) Setting objectives which are based partly on the objectives of the organization, partly on the needs of users
5) Choice of suitable methods and media
6) Trial
7) Evaluation with regard to user satisfaction and benefits, use of library, effects on participating staff etc.

On this basis it would be possible to guess that user education and marketing could be easily coordinated.

Target groups

Every library serves a population consisting of actual users, potential users and non-users. (Fig. 1)

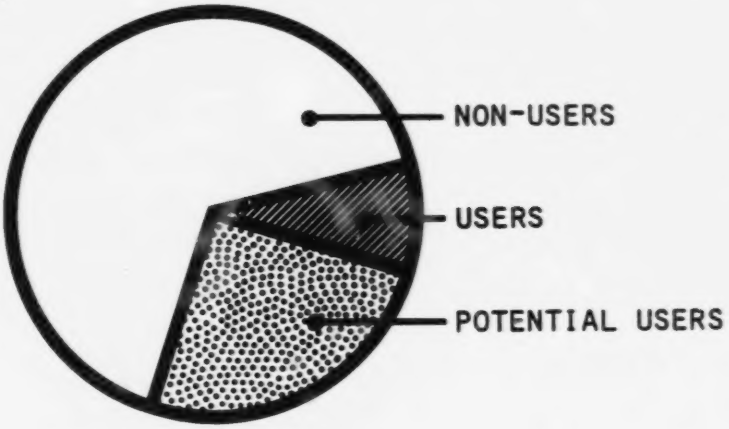

Fig. 1.

With increasing specialization the proportion of potential users in the total population becomes relatively reduced. The university library has, for example, fewer potential users than the public library, and the proportion potential: total users decreases still further for specialized libraries at universities of technology and industrial firms. In all types of library it is important that the ratio actual users: potential users is high.

University of technology libraries have traditional target groups - the research workers, academic staff and undergraduates and administrators at their own institution. Large well established technological university libraries have a wider secondary target group - users from other universities. In many countries, such as in Scandinavia they additionally serve 'external' users such as engineers working in industrial concerns or governmental organizations and, to a growing extent, members of the general public.

The existence of two main target groups (A) own university users and (B) external users, in itself poses problems, in that funding is provided mainly by the parent university for (A) and the needs of members of group (B) can be in conflict with the provision of an optimal service for (A). This has, in certain countries, been partly alleviated by the provision of funds for the library or libraries with national responsibility for information in technology, for example, Delft University of Technology in the Netherlands and Technische Informations Bibliothek (TIB), Hannover, in the Federal Republic of Germany.

The first target group is, however, both clearly defined and of prime importance for the university library. The function of the library should clearly be directed towards the needs of these users. One of the most important stages of any marketing process is that called "market research". This in terms of the library world means "user studies". In any marketing of the library it is essential to identify the component groups of users, study their information needs, and methods of obtaining information. Within the engineering field there are a number of disciplines such as electrical and electronics engineering, civil engineering, mechanical engineering, engineering physics and chemical engineering. Information handling patterns have been shown to vary widely between these different groups and within each group it is to be expected that there will be considerable individual differences, perhaps dependent on the individual's function, position in the organization and status. As a first stage for marketing (and for the development of a user education programme) it is important to find out as much as possible about the users and to act on this information. Many library user studies unfortunately remain academic exercises rarely leading to changes.

Condous (1983) pointed out the importance of marketing the library to administrators

> "An influential segment which is much neglected by libraries is the funder group. This segment is equally important. If there is no attempt to convince the funders of the value of the services provided by the library, then cutbacks are inevitable in the present economic crisis." (Ref. 9)

It is particularly important in times of financial pressure to show administrators the value of services and products provided by the library and the impact that these make on the users.

The need for promotion of libraries and their resources

There are a number of ways for a library to send out marketing information -advertising, publicity material, personal contacts, user education programmes, public relations. What is most important is that the people who 'market' their library in these ways really believe in the value of the products and services offered, and at the same time do not make promises that cannot be lived up to.

First of all potential users have to be made aware of the information resources available in the library. User studies often reveal that potential users have very little idea of what materials the library can offer and even less on how to use the tools available there. (Ref. 10).

The simple lack of awareness is one of the most important causes of non-use of libraries. Other factors which reduce use are: distance from user; poor availability of desired information - opening hours which do not correspond to the needs of the users; poorly designed physical access - shelving systems, signs etc; poor conceptual access via catalogues; negative attitudes - too many prohibitive rules; high costs - this is particularly applicable to online information searching. Some of these factors can be changed and a successful user education programme must be based, as is successful marketing, in tailoring the library to the users needs, rather than to the storage and handling of physical information items (often text-based). (Fig. 2)

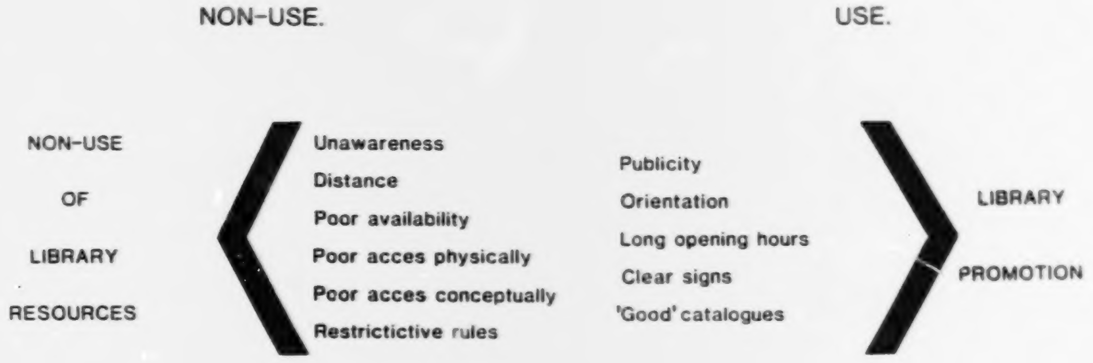
NON-USE.
USE.
NON-USE OF LIBRARY RESOURCES
Unawareness
Distance
Poor availability
Poor acces physically
Poor acces conceptually
Restrictictive rules
Publicity
Orientation
Long opening hours
Clear signs
'Good' catalogues
LIBRARY PROMOTION

Fig. 2 Factors affecting use and non-use of the library

One important factor that has to be considered is that there are other ways of obtaining information than through the university library or even by means of printed material. Should these alternative methods prove easier, cheaper, or more convenient to use, than the conventional library methods, then users will come to choose them. The university library is moving into the competive information business world - for better or worse?

Initial promotion

Promotion starts by making the user aware of the products and services available from the library or information centre. Most libraries make use of some form of printed promotional material - guides to the use of the library, lists of new acquisitions, newsletters, promotional leaflets describing online information retrieval services, posters systems and databases. This kind of material should always be produced with the user in mind. Printing and presentation should be as attractive as possible - after all the library is an attractive place isn't it? It must be admitted that some guides to the library seem to be designed to suggest this is a dry and dusty serious place which must be difficult to use! The disadvantage with this type of promotional material, or with advertisements in local press or university journals, is that they tend to be sent out indescriminately to potential users, who passively receive them.

The same can be said of many promotional audiovisual presentations and exhibitions. In addition, both these methods of promotion face comparison and competition with an ever-growing quantity of commercial productions. Who has not experienced the sorting of mail -all adverts to the WPB (Waste Paper Basket) - "Ah - that's better - it doesn't look so much now". Personal mailing or contact with potential users is an alternative approach. Markee points out, in an article on the marketing of online services, in 1982, that "People respond favourably to publicity that is personalized." (Ref. 11)

Initial promotion is closely akin to that part of a user education programme usually called orientation. The advantage of orientation courses are that potential users can be actually got inside the building, and providing that the library is reasonably attractive and well-planned, they have the chance to see the information resources available and meet a friendly helpful library staff. Should the library, however, be badly planned with poor signs and layout, potential users will be put off for a long time. There is indeed, no particular merit in using cryptic, barely visible signs in university libraries. Yet in a study of British libraries carried out by the Graphics Information Research Unit at the Royal College of Art for the British Library, in 1977, it was found that "the general standard of graphics was poor ... signs in particular tended to vary in design and construction" (Ref. 12). There is, fortunately, a growing awareness among librarians that sign systems are an important part of library planning, with a number of recent books on this subject. (Refs. 13, 14, 15)

The traditional approach to library orientation is the so-called guided tour, in which students are given a short tour of the library, during their first weeks as university students. Harlan has described a guided tour as follows:

> 'Batches of students - I have seen as many as thirty in a group - are herded through a dozen or so stations. The guide is not always a librarian, nor is he always well-prepared. "This", he says with a wave of his hand, "is the Periodicals Room, that", with a nod, "is CBI, a universal English language bibliography, dictionary arrangement with author, title and subject entries: You must remember that the main entry is author" ... Small wonder that at the third and fourth station, most of the students stop listening. Libraries and librarians, they conclude, are as bad as anticipated. Obviously one's efforts are best applied in finding ways of avoiding, not utilizing the library'. (Ref. 16)

This type of orientation is frequently given to new university students, at a time when they have little or no motivation to use the library in connection with their studies. The students themselves take little active part in the learning/teaching process, but tend to passively follow their guide. From the library administration point-of-view guided tours make heavy demands on staff time. To use guided tours when you have actually got new potential users into the library may well, at least in a large organisation, represent a missed opportunity.

Active learning techniques, where students can work at their own pace, are more likely to result in better retention of knowledge and satisfaction. Self-paced guided tours with exercises have proved to be a very good method for general library orientation. This method brings library users into the actual building where they carry out a series of practical tasks concerned with location of material, use of tools such as catalogues, borrowing routines and so on. In this way users actively obtain an awareness of the resources of a large university library, acquire confidence in using this, and also have the chance to meet a friendly, helpful library staff. Selfguided tours are widely used in the U.S. (Ref. 17) and their use has now spread to other countries such as Australia (Ref. 18) and Sweden (Ref. 19).

So much for orientation of new users. What about orientation and promotion of online information retrieval? Again printed material and audio-visual methods are available. The quality of some of these is often high, as they are produced by commercial information retrieval systems operators or database producers. For this particular form of promotion, it is particularly necessary to select the users (market segment) who are likely to need this service and be able to pay for costs involved (assuming that the library is charging and not subsidizing this service). Demonstrations of online and/or recorded searches are frequently used in orientation on computerized information retrieval systems.

Publicity is closely related to advertising, but tends to describe an organisation or service rather than a product. Publicity can take the form of articles in newspapers or journals, radio or television programmes. Publicity must be newsworthy and can play an important role in creating awareness or resources and affecting attitudes towards the library.

Promotion in depth

User education programmes should involve much more than orientation for new library users. A systematically designed user education programme should be closely geared to the needs of the users. Library and information use is not part of a separate academic discipline such as chemistry, history or psychology. It consists of a series of skills and an understanding of research techniques and communication in connection with different fields of study.

In the words of the Library and Information Services Council (U.K.) Working Party on Manpower Education and Training, 1983:

> "In general terms, the objective of user education programmes is to improve the general level of fact gathering and evaluation in problem solving - that is, user education can be defined as the transfer to individual users of the techniques by which they can specify their needs and acquire, evaluate, organize and communicate information." (Ref. 20).

User education programmes should go beyond user training. Training is concerned with learning relatively simple skills - how to use the catalogue, how to log in to IR systems, how to use commands for IR systems etc. Education is concerned with why to use certain information retrieval tools - indexes, abstracts or databases, why to use online information retrieval rather than manual IR, understanding of the pattern of communication so that you might even know why not to use the library for a given information need. Many so-called user education courses are in fact very short training sessions in how to use traditional library tools - catalogues, abstracts and indexes. True user education provides a means for the promotion of the communication and informational handling skills of the library staff -Gee's "trained mental attributes". The user education programme should not aim to produce 'librarians', but give an insight into information handling and possibilities.

Many authors have pointed out the need for cooperation between users, academic staff and library staff. (Ref. 21) This can be represented as in Fig. 3.

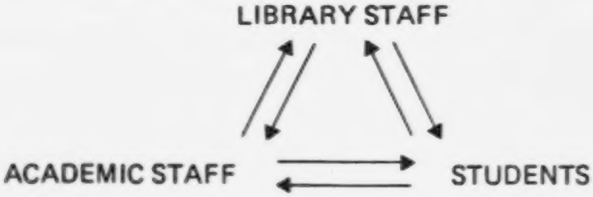

Fig. 3 The relationship between library staff, academic staff and students in user education

An ideal solution would be course-related education with close cooperation between library and academic staff. This can be achieved in many ways either by teaching staff or library staff or a combination of both. There is no point saying that one of these is best, the people who should carry out education in information handling depend on the local conditions. However, if user education programmes are given by information staff, they have a good opportunity to carry out library promotion.

User education work involves personal contacts as does reference work or information retrieval. They are related to personal selling where personal relationships are built up between a sales person and a potential customer. The user education worker, reference librarian, information specialist and staff working at the circulation desk all have the chance to establish personal contacts and this gives the opportunity of direct interaction with user needs. Satisfied clients return and maybe pass on the news about the information services available.

User education for external users and administrators

Most present day user education programmes, in university of technology libraries, are directed towards primary target groups - new library users, undergraduates and research students. In some cases, as in Sweden, these courses are paid for by faculties, in the same way as any other university course, say in statistics or English. This leads into the question of financial resources for user education programmes and for the library as a whole.

Funds can be obtained either as grants - from the parent organization or external sources - or by selling a product. User education can be used in both these ways. First of all - courses in information retrieval, especially online IR, can be given for practicing engineers. These courses can take the form of regular industrial courses - short seminars - one to two days, at regular prices for this type of work. At Chalmers university we have found that there is often a branch-oriented demand such as for the offshore industry or in connection with automation in mechanical engineering. Libraries and information centres today often have people with considerable expertise in EDP and/or microcomputers. These skills can again be used in the provision of courses for managers, engineers etc. This type of activity has been carried out, for example, at the Central Information Services at the University of London. In these ways the library can obtain extra financial resources, and, at the same time promote the image of a go-ahead organization in the information business. Comments of the type "I really had no idea that there was all this information so easily available", and "I did'nt realise that you had so much knowledge about computers in a library" reveal, perhaps, that it might be possible and desirous to change attitudes to libraries and library staff.

A particularly important area is the promotion of the library and its resources to administrative planners and decision makers. To what extent can 'user education' be used as a library promotion tool for this group? I would like to suggest that there are two possible methods. First - invite university administrators to take part in some well-tried and developed course in the user-education programmes. This will give them an opportunity to experience how the participants enjoy and value finding information, for their current study projects, in the library. It can also give them a chance to experience the frustration felt by users who find references to documents not held by the library. Preferably administrators should be asked to observe project/research oriented information work - where participants have real motivation to obtain practical results.

A second method would be to organize a short (administrators are busy people) one day course for administrative personnel where they themselves search for information. Here it would be desireable to involve them in searches for which they feel motivation - perhaps for information in connection with their job, or spare-time interests. Possible topics include the following: citation methods for evaluating research, information on higher education, energy studies, environmental questions etc. I believe that 'hands-on' experience of the information world could be a good way to introduce information management to university administrators.

Marketing within the library

Not all librarians are positive to marketing and promotion. Kotler pointed out (1979) that some practitioners in non-profit organizations were afraid, not that marketing would be ineffective, but that it would be too effective. - "They see funds and clients flowing to institutions that are willing to spend the largest sums of money on advertisement and promotion ... This fear is based on the fallacy of viewing marketing as primarily promotional." (Ref. 8) Any new function such as user education, online searching or marketing activities may be expected to be met with a certain amount of initial internal resistance, particularly in such traditional organizations as libraries. Efforts should be made to market the new functions internally. This can be done in many ways: seminars and 'open-house' meetings, staff-meetings, personal contacts, news letters, information bulletins, etc. This process, which requires considerable patience, is often time-consuming, but marketing for the acceptance of new functions cannot be over-emphasized.

The changing role of the university library

The traditional university library was centred round the storage function. To this was later added the service aspect, with, in many cases, excellent service by means of highly qualified reference staff using sophisticated catalogues and serving those users who actually came to the library or asked for information. This is an example of a reactive library - which reacts to user demands. In the proactive library, in contrast, the library staff actively promote and market the resources available to potential users.

How can the recent developments in computing and communications affect the technological university library? Libraries traditionally are oriented towards text and document information systems. The advent of computerized informational retrieval systems with access to a multitude of databases has resulted in an obvious increase in the speed and ease of obtaining references to documents. Systems operators have recently introduced non-prime-time information services - DIALOG with Knowledge Index and BRS with After Dark. These are directed towards the end-user and are easier to use than the corresponding prime-time systems. The use of AI - Artificial Intelligence to design expert systems, such as the online intermediary for cancer therapy searches developed by Pollitt, (Ref. 22) or RESEDA for medieval history developed at Centre Nationale de la Rechérche Scientifique (Ref. 23) can be expected to greatly facilitate end-user searching for references.

Today the user may experience delays and difficulties in obtaining the corresponding full-text documents. Electronic document delivery systems can, however, be expected to speed the transfer of full-text items from supplying source to the requester. Today many individual journal items are created in machine-readable form by means of a word processor. If central files of documents in machine-readable form are created, these items can be made accessible to users via existing terrestrial telecommunication links as for example in project HERMES using Teletex, (Ref. 24) via satellite delivery systems such as UNIVERSE - the Universities Extended Ring Satellite Experiment (Ref. 25) or the proposed APOLLO system (Ref. 26), or by means of terrestrial lines based on optical fibres. The creation of stored files of documents in the form of digital optical discs would enable these collections to be distributed to a wide number of centres for local online access or printouts. Experiments with electronic journals such as BLEND -the Birmingham and Loughborough Electronic Network Development (Ref. 27) show the possibilities for the exchange of information, views and ideas without the aid of paper products.

The net result of these new technologies and their applications is to widen the options. The various possibilities and routes for the spread of information will increase considerably. No longer will libraries have a clear cut dominant role based on the spread and handling of textual information. Information systems will be more readily accessible to people who wish to use them, particularly in environments where there is easy access to computing and telecommunication systems (Universities of Technology) It may be, as Belkin has suggested, that information systems will change from being text-dependent towards being more user-dependent in terms of information needs (Ref. 28).

How can the University of Technology Library adapt to the online changes?

The University of Technology Libraries will be profoundly affected by developments in computing and telecommunications. As Cooper pointed out recently "Document retrieval systems constitute one, but only one, class of IR systems" (Ref. 29) and competition from other types of IR systems and information organization is likely to grow.

The University Library has, however, the possibility to exploit the new technologies as well as the advantage of holding a relatively large physical document collection. The staff are professional information specialists. One of the problems for information users in the future will be how to select and use the most suitable channels for information retrieval, communication and document delivery, and here user education will be able to play an important role.

During recent years, libraries of all types have been showing an increasing awareness of the need to actively go out and tell prospective users about the information resources available to them. This interest in marketing and promotion is partly due to greater awareness of the use of the libraries as shown in user studies, and partly due to economic pressures - organizations are expected to be cost effective at a time when funding is difficult.

The time has come to develop user-oriented programmes such as user-dependent IR systems, and user-dependent education. The marketing process is geared to exploring user needs and finding ways of satisfying these. The Library can no longer wait for users to come, they must go out and promote the resources and skills available within the organization.

References

1. KOTLER, P. & LEVY, S.J. Broadening the concept of marketing: Journal of Marketing, Vol. 33 (1969) 1, pp 10-15.

2. Marketing definitions: a glossary of marketing terms. Committee on definitions. Chicago, American Marketing Association, 1960.

3. KOTLER, P. Principles of marketing. Englewood Cliffs, Prentic Hall, 1980. p 17.

4. GEE, R.D. Inspiring a promotional creed in information service; an examination of how far the classical theories of customer-oriented marketing are applicable within the realities of information service organisations. In: Kelbrick, N. (ed) Proceedings of the 25th Annual Study Group of the Library Association, Reference, Special and Information Section. London, RSIS, 1977. pp 29-44.

5. KOTLER, P. Marketing for non-profit organizations. Englewood Cliffs, Prentice Hall, 1979.

6. YORKE, D.A. Marketing the library service. London, Library Association, 1977.

7. Cronin, B. (ed) The marketing of library and information services. London, Aslib, 1981.

8. KOTLER, P. Strategies for introducing marketing into non-profit organizations. Journal of Marketing, Vol. 43 (1979) 1, pp 37-44.

9. CONDOUS, C. Non-profit marketing - libraries' future? Aslib Proceedings, Vol. 35 (1983) 10, pp 407-417.

10. FJÄLLBRANT, N. Library user education and the effectiveness of library performance. In: Fjällbrant, N., (ed.) Developing library effectiveness for the next decade. Proceedings of the 7th IATUL Conference, Leuven, May 16-21, 1977. pp 67-76.

11. MARKEE, K.M. Online services - marketing Proceedings of the National Online Meeting (third), New York, Learned information, 1982.

12. SPENCER, H. and REYNOLDS, L. Directional signing and labelling in libraries and museums: a review of current theory and practice. London, Readability of Print Research Unit, Royal College of Art, 1977. 117 pp.

13. REYNOLDS, L. and BARRETT, S. Signs and guiding for libraries. London, Bingley, 1981. 158 pp.

14. Sign System Manual Van Pelt Library, University of Pennsylvania, 1981.

15. POLLET, D. and HASKELL, P. Sign systems for libraries: solving the way-finding problem. London, Bowker, 1979.

16. HARLAN, R. 'Welcoming notes' in Instruction in the use of the college and university library. Berkeley, University of California School of Librarianship, 1970.

17. LYNCH, M.J. 'Library tours: the first step'. In: Lubans, J. (ed) Educating the library user. London, Bowker, 1974. pp 254-268.

18. DASH, U. 'The self-guided library tour' Australian academic and research libraries 8 (1), 1977. pp 33-38.

19. FJÄLLBRANT, N. et al. 'Self-paced exercises for library orientation'. *Aslib Proceedings*, Vol. 33 (1981) 6. pp 251-256.

20. Library and Information Services Council. Working Party on Manpower Education and Training. Discussion paper on user education. June 1983.

21. FJÄLLBRANT, N. & MALLEY, I. *User education in libraries*. 2 ed. London, Bingley, 1984. 251 pp.

22. POLLITT, S.A. A 'front-end' system: an Expert System as an online search intermediary. *Aslib Proceedings*, Vol. 36 (1984) 5, pp 229-234.

23. ZARRI, G.P. Some remarks about the inference techniques of RESEDA, an "intelligent" information retrieval system. In: C.J.van Rijsbergen (ed) *Research and development in information retrieval. Proceedings of the third joint BCS and ACM symposium, King's College, Cambridge, 2-6 July 1984*. Cambridge, Cambridge University Press. 1984. pp 281-300.

24. YATES, D.M. Project Hermes. *Aslib Proceedings*, Vol. 35 (1983) 4, pp 177-182.

25. WINFIELD, B. Document transfer by satellite. *Aslib Proceedings*, Vol. 36 (1984) 4, pp 177-185.

26. VERNIMB, C. Promotion of electronic document delivery by the Commission of the European Communities. *Electronic Publishing Review* Vol. 3 (1983) 3, pp 209-11.

27. SHACKEL, B. Progress of the blend-line 'Electronic Journal' project. In: Fjällbrant, N., (ed.) The future of serials: publication, automation and management *Proceedings of the Tenth Meeting of IATUL, Essen, June 6th - June 10th, 1983*. Gothenburg, Chalmers University, 1984 pp.69-82.

28. Belkin, N. et al. ASK for information retrieval. Part I. *Journal of Documentation*, Vol. 38 (1982) 2, pp 61-71.

29. COOPER, W.S. Bridging the gap between AI and IR. In: C.J. van Rijsbergen (ed) *Research and development in information retrieval. Proceedings of the third joint BCS and ACM symposium, King's College, Cambridge, 2-6 July 1984*. Cambridge, Cambridge University Press, 1984. pp 259-265.

LIBRARY PROMOTION BY COMPUTER

Ian Malley

The Pilkington Library, University of Technology, Loughborough, U.K.

Abstract

The paper discusses the current and future use of the computer in the promotion of the resources and services of academic libraries.

The computer is first of all considered alongside other modes of promotion and instruction used in the field of teaching of information skills, and the instructional advantages and disadvantages inherent in the computer are weighed to determine the probable success or failure of its use in the context. The purely administrative and managerial problems associated with computer technology (cost, software availability, etc.) are also discussed at this stage, again particularly in relation to other modes. There is also consideration of the relative advantages of using mainframe computers, minicomputers and microcomputers, although it is recognised that the choice is largely determined by the availability of hardware already operating in the academic library.

The use of the computer as a promotional tool is then discussed in the context of the computer's other uses in the library, namely to access the library catalogue, to access in-house on-line information services, as a current awareness device, as well as a means of access to external, commercial bibliographic and non-bibliographic data bases. Is the close association of these various functions likely to enhance library promotion and help to integrate it with other library services?

The question is then considered, to what degree can library promotion and orientation be extended to provide in-depth instruction in the use of reference and information sources.

Although it is library promotion by individual academic libraries that is the main focus of the paper, the potential for a nationally integrated campaign of library promotion by computer is investigated. This could either emerge from the development of a network based on individual libraries or arise from a national, co-ordinating body set up to stimulate library promotion. Such bodies exist in some countries but are still awaited in others. Their role in this new form of library promotion is considered. Other questions of external support for library promotion by computer are discussed. For what assistance is provided and can be expected from commercial on-line data base companies?

Finally, the computer's potential for getting almost automatic data on the user's responses, satisfaction, learning success, etc. is examined, based on the nature of existing programs. Such built-in evaluation, coupled with the user's attitude towards the technique, could enable libraries to begin to measure with greater confidence the impact of all library promotion, whatever the mode used.

Throughout the paper the various questions and problems associated with library promotion by computer are illustrated by reference to a number of case studies of such work in academic libraries in several countries.

1. Introduction

It is perhaps useful at the outset to outline what is implied by library promotion. There are three generally recognised areas of user education, as follows:

1. Promotion
2. Orientation
3. Instruction

Neither of these terms is self-explanatory, but perhaps the essential difference between the terms becomes more apparent if we consider them in the context of a library service such as on-line search services.

Library promotion would mean in this context making the user aware and stimulating demand for on-line search services. Library orientation would mean showing the user where this service is available. Library instruction would mean instructing the user in the use of on-line searching. This division, although neat in theory, is rarely as clearcut in practice. Even if it were it might not be desirable. However, for the purposes of this discussion (and incidentally in the general planning of user education programmes - particularly those which include teaching aids), it is convenient to consider the subject in these terms.

Until relatively recently the use of the computer in user education was confined to instruction -- hence we had computer-assisted instruction (CAI) and computer-assisted learning (CAL). Lately the use of the computer as an orientation tool has become more common. But only rarely has the computer been used as an avowedly promotional tool in user education. There are several reasons for this, not least that anything which is truly promotional has been markedly absent in user education.

It could be that in library promotion the computer could fill a useful niche and this paper considers advantages and disadvantages, current activity and the potential for further development. Since the point has been made about the overlap between promotion and orientation, reference will also be made to recent developments and examples of the use of the computer in library orientation.

2. Advantages and disadvantages of the computer medium

First of all it is necessary to consider the advantages and disadvantages of the computer in general as a user education medium. User education has never been slow to use new media and techniques, though too often we have rushed into the new medium without considering its appropriateness to the message and without comparing it to other media. That is not to say that research on the comparison does not exist: it does, but it has usually been carried out only subsequent to the initial applications.

Advantages

1. Can reach a large number of users
2. Can be constantly available to the user
3. Can be replayed for reinforcement and difficult points
4. Uniformity of presentation
5. Can be used anywhere
6. Can be interactive
7. Can be self-pacing
8. Information on learning progress could be made available to the user
9. Can allow for different levels of ability amongst users
10. Alterations and updating can be easy

Disadvantages

1. Cost of materials and equipment is high
2. Production of content requires a high level of expertise and much time to prepare
3. Subject to mechanical failure
4. Users need to be trained to use the equipment

Although not all of these advantages and disadvantages are relevant to the use of the computer in every mode (promotion, orientation and instruction), it is clear that the advantages in general outweigh the disadvantages - and especially so if good skill availability and equipment reliability can be assumed, in which case most of the disadvantages disappear.

If one compares the computer to other media used in user education in terms of these advantages and disadvantages one can see that basically the media have many similar characteristics. Take, for example, the comparison with the videotape:

Advantages	Computer	Videotape
1. Can reach a large number of users	Yes	Yes
2. Can be constantly available to the user	Yes	Yes
3. Can be replayed for reinforcement and difficult points	Yes	Yes
4. Uniformity of presentation	Yes	Yes
5. Can be used anywhere	Yes	Yes
6. Can be interactive	Yes	No
7. Can be self-pacing	Yes	No
8. Information on learning progress could be made available to the user	Yes	No
9. Can allow for different levels of ability amongst users	Yes	No
10. Alterations and updating can be easy	Yes	No

	Computer	Videotape
Disadvantages		
1. Cost of materials and equipment is high	Yes	Yes
2. Production of content requires a high level of expertise and much time to prepare	Yes	Yes
3. Subject to mechanical failure	Yes	Yes
4. Users need to be trained to use the equipment	Yes	Yes

At first glance the computer has apparently got several advantages over the videotape, but which are the important ones? Besides those noted, the computer (at least at present) has the advantage of novelty; but that is the sort of ephemeral advantage that the videotape once had over the tape-slide. To find the important advantages one has to look behind and in more detail at the advantages listed here. For the purposes of comparison they have been rather uniformly and imprecisely noted as, for example, 'Can reach a large number of users' and 'alterations and updating easy'. As a matter of fact it is especially within these two advantages that the main advantages of the computer in library promotion lie.

The computer's particular value to library promotion will be elaborated upon in a moment, but it is noteworthy that four other advantages, namely, (6) Can be interactive, (7) Can be self-pacing, (8) Information on learning progress could be made available to the user, and (9) Can allow for different levels of ability amongst users, are all valuable assets in CAI and CAL. And incidentally, these four advantages of the computer, which the videotape does not have, are held by the new, emerging medium of interactive video.

In terms of library orientation, at least in the sense of finding one's way around a library, there seems to be no particular advantage in the computer over the traditional maps, signposting and tours, yet this is where most of the current activity is concentrated. Its use in this context would appear to be an example of 'the computer in search of an application' or 'the translation of matter from one format (print) to another (audiovisual) with little to gain from the transfer'. But user education is not alone in this indulgence, and we would hope to settle down soon to develop the use of the computer in ways that can add a new dimension to user education, and library promotion in particular.

Returning to the question of the advantages of the computer that make it especially appropriate to library promotion, we have first of all the fact that 'it can reach a large number of users'. This does not mean that it can be used with large groups, as for example the videotape can be - this facility is inappropriate to promotion anyway. It means that the computer can be accessed by a wide range of people beyond the library, and not just those who come into the library. This is an essential part of promotion, i.e. getting to the non-users.

Ketley, in describing University of Bradford Library's LIBLINE (an in-house online information system) put it simply thus:

> 'Time-sharing on the mainframe had the additional advantage in that any program mounted by the library could be accessed outside the library throughout the university to anyone with a terminal connected to the computer communications network'.[1]

A second advantage of the computer is that 'alterations and updating can be easy' - provided of course you have the skill at hand to input new data or make amendments to the program. This second advantage, taken alongside the first - namely that it 'can reach a large number of users' - suggests that the computer is a fast, inexpensive and wide-distribution current awareness device. This current awareness facility can bring an immediacy and urgency to promotion, which a few libraries are now beginning to exploit. Ravilious, in describing University of Sussex Library's use of the micro-computer in user education, points out that

> 'All libraries need a facility for 'blackboard' announcements, alerting readers to changes in hours or disruptions in the normal pattern of library services - interruptions or circulation services for routine maintenance, bank holiday opening hours, and so on.'[2]

One might argue that many of these announcements are already made in libraries without computer facilities, through noticeboards, etc. These are 'fast' and 'inexpensive' but they are accessible only in the library. Once again it is accessibility from outside the library that gives the computer the edge.

On the obvious debit side of computer use is the high cost of computer hardware and software, and skills associated with both. This is undeniable but some of these costs become less critical when it is emphasised that one would not buy computer hardware for library promotion alone. One may buy commercial software for this purpose, but there is so little available that you will probably have to develop it in-house. The availability of these in-house skills is crucial, and the real cost of the labour should not be ignored - as it has tended to be in the costings of other media in user education. It doesn't matter if you have access to the programming skills of your institution's central mainframe computer team, or the skills of your library's systems analysts using a minicomputer, or the skills of a librarian/computer freak experimenting with his or her own home microcomputer, they all have to be paid for indirectly or directly.

This brings up the question of the relative advantages of using mainframe computers, minicomputers or microcomputers. In spite of the considerable activity in the development of microcomputer software for user education, both commercial and otherwise, one has to recommend the use of time-sharing mainframe computers for library promotion to gain the benefits of access to both non-users and users of the library. Agreed, microcomputers can be networked but there are too many different manufacturers and their products to make the development of a promotional network at all viable. On the other hand use of the mainframe computer can mean that programming skills lie outside the library. This could make programming alterations slower but at least proper use is being made of professional skills - not very common in user education. As far as content is concerned amendments and additions can nevertheless be made in the library.

The point has already been made that you would not buy computer hardware for library promotion alone. These days it would not be necessary to buy simply for that purpose, because computers are used in an increasing variety of situations in the academic library -for book circulation, for on-line public access catalogues, for on-line searching, etc. Although it is probably true that with most of the applications the terminals are still interrogated by the librarian as intermediary, increasingly the library user is being permitted direct access to services and information through the terminals. The question has to be raised then, as to the relationship of the provision of these services to service and information promotion.

If we take the example of on-line public access catalogues, there is only a small amount of instruction in the use of catalogues associated with this facility - which begs the question 'why in the past did we have all those large printed guides to the catalogue?' And as these facilities become more user-friendly there will be even less need for explicit instruction. However, there are possibilities for promotion of other services and particularly promotion for the purpose of exploiting specific sections of library stock. Provided we do not forget that the user's search for information must not be deflected by instruction thrust upon him or her, there is an opportunity for some instruction, some orientation and some promotion, which is closely and simultaneously linked to an information search and hence information need. The interactive nature of the computer of course leaves the user the choice of taking or leaving this instruction, orientation and promotion.

3. National library promotion

Although it is library promotion by individual libraries that has been the main focus of this paper, the potential for a nationally-integrated campaign of library promotion by computer is there - and perhaps necessary. Make no mistake about it, academic libraries are under threat, and paradoxically at a time when the information business was never stronger and busier - primarily because of the computer. It would be some sort of poetic justice if we could use the computer to reassert ourselves.

National library promotion could either emerge from the development of a network based on individual libraries or arise from a national, co-ordinating body set up to stimulate library promotion. In the UK where we have as yet not got a central body for library promotion, we do have the facility of interactive videotex (Prestel), which has already been used to put up pages promoting libraries and information. Similar work has been done in Canada with their teletex equivalent, Telidon, and experiments on the use of this system were carried out at University of Waterloo Library.[3] Although these developments are largely emerging on the initiative of individual libraries or bodies with a vested interest in the application of information high-tech in libraries, clearly there is something worth investigating on a national scale and level.

But if I may end with a caveat in the form of a quote by Knapper:

> 'The success of any instruction, whether technologically-based or not, depends primarily not on a particular delivery system (be it professor or terminal) but on the quality of the material presented, the effectiveness with which it is organized and on the characteristics and motivation, and skills of the learners themselves.'[3]

1. Are we using the right medium?
2. Are we making the best use of the medium?
3. What are we promoting?
4. Have we still got something worth promoting?

References

1. KETLEY, P. LIBLINE: an affordable inhouse online information system. INFUSE, vol. 7 (1983) no. 5, pp. 6-9.

2. RAVILIOUS, C.P. Microcomputers for user education. INFUSE, vol. 8 (1984) no. 5.

3. MEEK, G. Videotex: a new approach to library instruction. In: Fox, P. & Malley, I. eds. Third International Conference on User Education, University of Edinburgh, 19-22 July 1983. Loughborough, INFUSE Publications, 1983, pp. 151-155.

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LIBRARY USER EDUCATION AND PROMOTION OF THE ONLINE INFORMATION RETRIEVAL SERVICE AT THE VRIJE UNIVERSITEIT BRUSSEL

Paul Nieuwenhuysen

Vrije Universiteit Brussel, Brussels, Belgium

Abstract

As an introduction, the history of the Free University of Brussels is sketched and its library/information and documentation center is briefly described; in particular, mention is made of the classification of the collection (U.D.C.), of the user-friendly online catalogue (using VUBIS software) and of the online information retrieval service (searching DIALOG).

Some limited efforts are made towards library user education. A guided tour of the libraries is offered to the new students by library scientific staff. A slide program with audio tape is used to orient all interested visitors. The user-friendly online catalogue is designed for self-teaching. A very cheap printed brochure about the library can be purchased. Subsequent instruction is not (yet) offered formally by the library, instead, the faculties offer informal and occasionally formal instruction.

Techniques to promote online information retrieval are listed and briefly discussed. This may serve as a check-list for (future) managers of online information services.

In conclusion, the importance is emphasized of the constraints which are imposed by the limited financing and staffing of a library/information and documentation center.

1. Introduction

1.1 Vrije Universiteit Brussel (V.U.B.)

In 1834, the Université Libre de Bruxelles (U.L.B.) was founded; French was the main language. In 1968, this university was split into two independent universities : the U.L.B. and the new V.U.B. where Dutch is the main language. The V.U.B. covers almost all disciplines, having about 6500 students, 400 professors and 500 scientists.

1.2 The library and information/documentation center of the V.U.B.

The information/documentation center is a recently created department in the "Central library" of the V.U.B., to complement the more classical library functions in this online age.

About 35 employees work in the library : 1 chief librarian
3 scientific librarians
± 30 administrative staff

The present collection consists of about 200.000 volumes and 2.300 periodicals are regularly received. Annual expenditure on periodicals is about 200.000 $.

The library is user-oriented : free access and loans, arrangement of the collection in open-stack according to an abridged U.D.C. system.

The collection is located in four libraries on three campuses :

Campus in Etterbeek :	Science and technology Human and social sciences.
Campus in Jette :	Medicine and pharmaceutical science.
Campus in Rode :	Molecular biology and biochemistry. (a V.U.B./U.L.B. joint research library)

Online information retrieval at the V.U.B. library and information/documentation center has two important aspects for the information-seeker :

1) Retrieval from the internal library database, i.e. the catalog of the collection, without intermediary, using terminals in the libraries. The system is user-friendly and menu-driven; the software has been developed at the V.U.B. and is named VUBIS (Alewaeters et. al., 1982; Verpoorten, 1984, in these Proceedings). Up to now, seven terminals can be accessed by the public and this number will be increased soon.

2) Retrieval from external databases, mainly those distributed by DIALOG Information Service since 1978. One intermediary prepares and executes the searches, in close cooperation with the information-seeker. The total expenditures for 1984 amounted to about 16.000 $.

In addition, both information retrieval systems provide selective dissemination of information (S.D.I.).

2. Library user education

First of all, it should be emphasized that a user-friendly library without user education is better than a "library for librarians" with extensive user education.

In the last line "education" should read "adaptation".

This can be stated even more directly : see Fig. 1.

The general need for library orientation and instruction, and their goals and objectives, have been described earlier, as well as the contents of orientation and instruction programs (e.g. Fjällbrant and Stevenson, 1978; Lubans, 1978; Renford and Hendrickson, 1980; Rice, 1981; Breivik, 1982; Gorin, 1982).

The limited library user education program at the V.U.B., geared toward the science and technology faculties, is listed in Table 1.

LIBRARIES

FOR

~~LIBRARIANS.~~ Users

Fig. 1

Table 1 : Library user education at the V.U.B.

WHAT	FOR	BY
Guided tours of libraries + explanation of Universal Decimal Classification + demonstration of online-catalog	All new students (sent by faculties)	Scientific collaborators of the library
Orientation in the library by a tape/slide program (cfr. Appendix)	All visitors and users	Made by library staff
Instruction of the use of the online-catalog	All (slow) users of the catalog	Incorporated in the software = user-friendly = self-teaching. (cfr. Alewaeters et al., 1982)

Printed guide **(cheap)** **(regularly updated)**	**All users**	**Library staff**
Subject-specific library instruction (very limited)	Advanced undergraduate students	Professors and/or their assistants
Promotion of online information retrieval from external, remote databases	All (potential) users	Intermediary = scientific collaborator
Brief instruction about online information retrieval from external databases	All those who request an online search	Intermediary = scientific collaborator
Continuing training program (Seminars and visits to other libraries)	Library staff and other interested persons	Scientific collaborators of the library + self-study + library schools

Generally speaking, audiovisual approaches have served to de-emphasize the more traditional guided tour of the library. However, we agree with Rice (1981) that the real essence of library orientation is the communication of a willingness to help and that this can be accomplished best by personal means.

A tape-slide program orients new users of the science and technology library (cfr. Appendix). The advantages of this type of program include

- low cost
- ease of handling, modifying and updating
- durability

No use is made as yet of video-tape, film or computer-assisted instruction.

Library instruction for advanced chemistry students is now incorporated in their instruction in laboratory techniques. An introduction is presented by a research chemist. This is followed by about 10 hours work in the library, mainly devoted to the use of the hard-copy of Chemical Abstracts. Other advanced students are taught more informally about information retrieval and the use of libraries, by their dissertation supervisors; unfortunately, however, some of these are not sufficiently aware of the growing possibilities of online-searching.

The promotion of external online information retrieval services cannot be separated from the broader concept of library user education. In particular making students aware of the possibilities of this type of information retrieval should be one of the many objectives of a university. During the preparation of their dissertations as well as in their later work, graduates will be confronted by the information-explosion. Unfortunately, the reluctance to promote online information services still exists in institutions with limited budgets. Several promotion techniques have been discussed in this context (e.g., Pensyl et. al., 1975; Ferguson, 1977; Schmidt, 1977, 1978; Paul, 1978; Smith, 1980; Bahr, 1980; Raitt, 1980; Antony and Graziano, 1980; Plomondon and Bigelback, 1984).

Patrons requesting online information searches are briefly instructed by the intermediary during the reference interview about this method of information retrieval. Cooper (1976) has outlined some of the advantages (high receptivity, individualized instruction, ...) and limitations (limited number of individuals instructed, time constraints, ...) of this kind of informal instruction.

'Continuing training of library staff' is included in Table 1. This is a category which can (and should ?) be considered as indirect user education. The need for this program seems high in view of the rapid evolution of information and documentation work in the online age. The program entails the following topics :

Organization of the library and information/documentation center
Types of libraries
Classification systems
Public services

Basic principles of information science and library automation
The V.U.B. online-catalog (Principles + exercises)
The interlibrary loan system
The information explosion
Current awareness
Retrospective information searches
Reference books and journals (Principles + tape/slide programs + demonstrations + exercises)
Online information retrieval (Principles + selection from the DIALOG slide program + demonstrations)
Principles of marketing applied to the library
+ Visits to various libraries/information and documentation centers.
+ Seminars by invited experts (e.g. database-producers)
+ Evaluation.

An expansion of education on "How to find information?" seems needed, also at the V.U.B. At least some seminars should be organized, complemented by audiovisual programs, on the information explosion, reference journals, online information retrieval, etc.... followed by demonstrations and exercises for all advanced students, organized by scientific library personnel, eventually in cooperation with faculty. This would ease the task of dissertation supervisors. In view of the large audience (all the students), audiovisual instruction programs would be very helpful. Most of the available packages are in English only. This should cause no difficulties for advanced students, however. Since the primary aim is the teaching and development of performance skills (how to find the information one needs), practical library exercises should be the principal vehicle by which sources of information are introduced to the students, as emphasized by Gorin (1982).

References

ALEWAETERS, G., NAMENWIRTH, S.M., SEGEBARTH, C. & VERPOORTEN, M. VUBIS: A user-friendly online system. Information Technology and Libraries, vol. 1 (1982) pp. 206-221.

ANTONY, A. & GRAZIANO, E., Impacts of the promotion of online services in academic libraries. Educational Resources Information Center, 1980. 39p. (ERIC report ED-197 793).

BAHR, A., Promotion of online services. In: Hoover, R.E. ed. The library and information manager's guide to online services. New York, Knowledge Industry Publications, White Plains, 1980, pp.161-180.

BREIVIK, P.S., Planning the library instruction program. Chicago, American Library Association, 1982. 146 p.

COOPER, N.P. Library instruction at a university-based information center: the informative interview. R.Q., vol. 15 (1976) no. 3, pp. 233-240.

FERGUSON, D. Marketing online services in the university. Online, vol. 1 (1977) no. 3, pp. 15-23.

FJÄLLBRANT, N. & STEVENSON, M. User education in libraries. London, Bingley, 1978. 173 p.

GORIN, G. An approach to teaching chemical information retrieval. Journal of Chemical Education, vol. 59 (1982) pp. 991-994.

LUBANS, J. Jr., ed. Progress in educating the library user. New York, Bowker, 1978. 230 p.

PAUL, H.J., Promotion and publicity for on-line bibliographic services in academic libraries. San Jose State University, Master's Thesis, 1978. 62 p. (ERIC report ED 157 538).

PENSYL, M.E., BENENFELD, A.R. & MARCUS, R.R., Techniques used to promote a fee-for-service on-line search facility in a university community. In: 38th ASIS Annual Meeting. Boston, 1975, pp. 153-154.

PLOMONDON, T. & BIGELBACK, B., Promoting online services to college faculty members. In: National Online Meeting 5, New York, April 10-12, 1984. Medford, Learned Information, 1984, pp. 287-292.

RAITT, D.I., Marketing and promotion of online services for intermediaries. In: 4th International Online Information Meeting, London 9-11 December 1980. Oxford, Learned Information, 1980, pp. 265-274.

RENFORD, B. & HENDRICKSON, L. Bibliographic instruction : a handbook. New York, Neal-Schuman Publishers, 1980. 192 p.

RICE, J. Jr. Teaching library use. A guide for library instruction. Westport, Greenwood Press, 1981. 169 p. (Contributions in librarianship and information science; 37).

SMITH, P.K. Marketing online services. Part 1. Online, vol. 4 (1980) no. 1, pp. 60-63. Part 2. Online, vol. 4 (1980) no. 2, pp. 68-69.

SCHMIDT, J.A. How to promote online services. Online, vol 1 (1977) no. 1, pp. 32-38.

SCHMIDT, J.A. Outline for an on-line public relations program. Online, vol. 2 (1978) no. 4, pp. 47-50.

Appendix.

"ORIENTATION IN THE SCIENCE AND TECHNOLOGY LIBRARY OF THE V.U.B.":

A TAPE/SLIDE PROGRAM BY JACQUES DE KIMPE AND PAUL NIEUWENHUYSEN

Demonstration of the first version of this program at the IATUL conference in Delft was of interest to many participants. Therefore, it is outlined here. Unfortunately the color slides can only be reproduced here in black and white (Figure 2). The advantages and disadvantages of this kind of program have been discussed earlier (e.g. Rice, 1981, and refs. cited therein).

Hardware objectives.

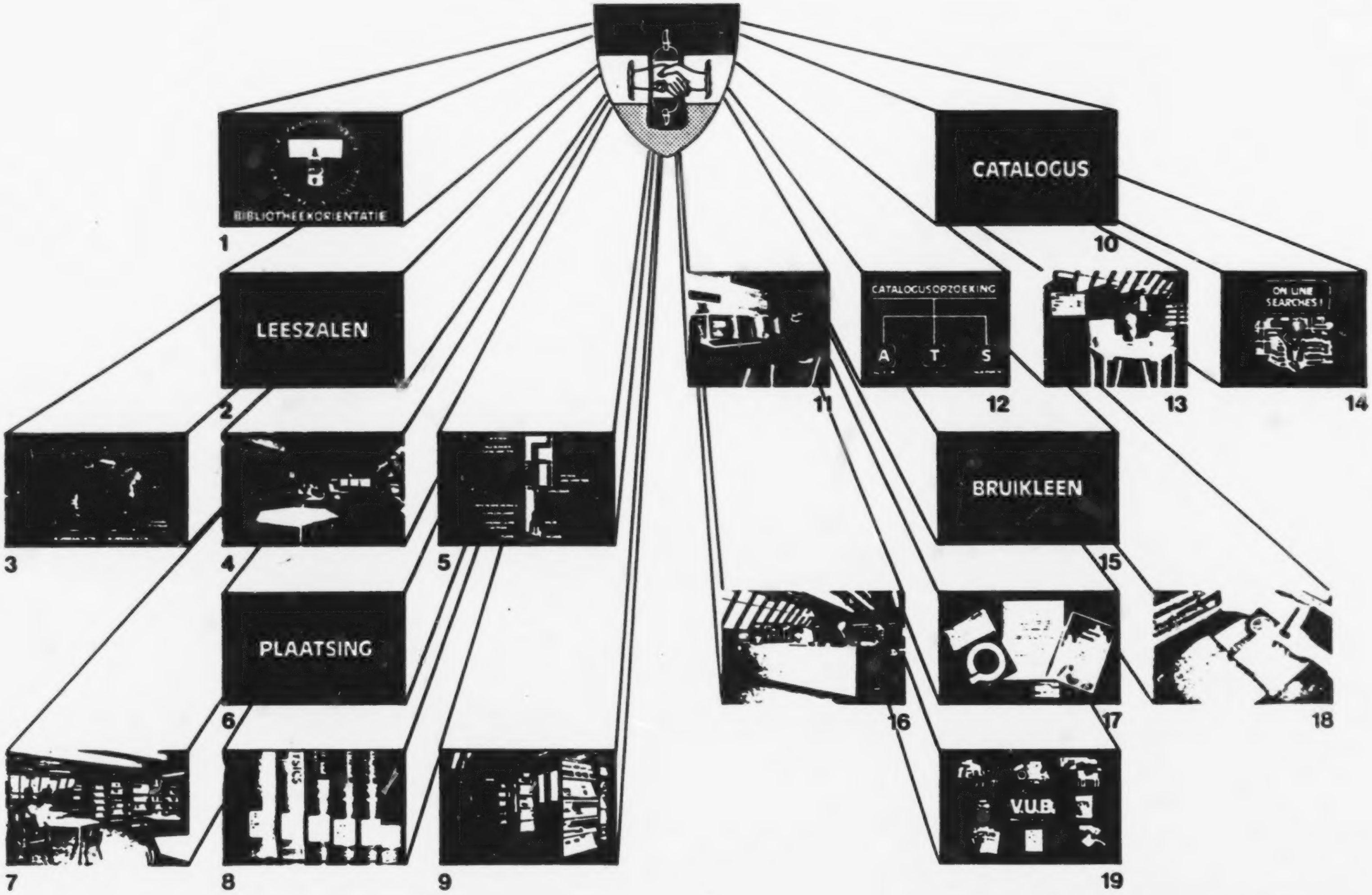
The technical objectives are, firstly, to obtain a semi-automatic tape/slide system, so that users do not have to press more than one button to start the program. Secondly, another user must be able to proceed into the program without any manipulation, such as rewinding audiotape or replacing slides.

To satisfy these objectives, an integrated tape/slide projector is used (Series 4000 from Telex Communications Inc.), with a Caroussel 80 slides loader and an audiocassette. The software (tape/slide program) was designed in such a way that there are 10 minutes tape for 20 slides.

This means that a full loader contains four identical series, after viewing the first slide series the second one begins until the loader has completed one full tour. The 10 minute audioprogram has been put on an endless tape. To obtain a "stop" at the end of the program, a piece of metallic coated tape has to be inserted between the end and the beginning of the program. Endless cassettes of more than 20 minutes are not recommanded because of the thinness of the tape. In that case troublesome tape failures may be expected. Tracks 1 and 2 contain the audio program and tracks 3 and 4 are used to drive the slides. An additional hardware requirement is one or more headphones. It is possible to connect a listening station having 6 or 8 plug-in jacks; as a consequence the tape/slide program can be used by several library users at the same time.

Given these limitations, the software has to be constructed in such a way, that the audioprogram can fit into a 20 minute endless tape or less (it is always possible to cut the tape), and that a multiple of the number of slides equals 80.

The tape/slide program includes further messages such as : no-smoking in the library, check-out system, and a search strategy poster. This information is included visually but is not mentioned on the tape.


BIBLIOTHEEKORIENTATIE
1
CATALOGUS
10
LEESZALEN
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CATALOGUSOPZOEKING
A
T
S
ON LINE SEARCHES!
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PLAATSING
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V.U.B.
19

BIBLIOTHEEKORIENTATIE

This kind of library orientation helps users in locating current library materials, but it does not instruct patrons how this material is to be used. For that purpose library personnel is available.

The program is made up of 4 modules, corresponding to the program's main objectives. Plans exist to implement other tape/slide orientation programs in other library departments also. The modular design permits the use of parts of this first program and the implementation, at low cost, of a new one for the other V.U.B. library departments.

Software objectives

In view of the available budget, it was decided to implement an inhouse made tape/slide program as a complement, not a substitute, to the guided tours of the library. Thus the main objectives are :

1. To familiarize new students and other users with V.U.B. library collections generally, and more specifically with that portion of the collection of interest to the patron. (Slides 2 to 5)

2. To explain briefly the methods of shelving books, bound periodicals as well as single periodical issues. (Slides 6 to 9)

3. To make users aware of the advantages of a user-friendly online catalog and explain briefly the different search possibilities of that catalog. In association with catalog searches, point out the other services which are offered to the user, such as reference materials and online searches in external databases. (Slides 10 to 14)

4. To define loan policy and enumerate other services users can expect from the loan-desk, including the assistance available from library staff. Here information is also included about the interlibrary loan system. (Slides 15 to 18)

NEW DEVELOPMENTS IN INFORMATION AND MARKETING TECHNIQUES FOR SCIENCE AND TECHNOLOGY

Shirley V. King & Pesi J. Gazder

Science Reference Library, London, U.K.

Abstract

The triple goals of marketing, user education and library services should not be regarded as separate activities in scientific and technical information, but as activities complementing and supporting one another. Online systems have long since passed the development stage and are now completely accepted as an integral part of day to day library services. They, together with other new technological developments, are now being used not only in library services but also in user education and marketing. Some ways in which online and new technological developments are being integrated into marketing and training are examined and described. Special attention is given to the range of ways in which the new facilities offered by public viewdata systems are being used for marketing, user education and library services.

This paper will describe some of the ways in which the new technology now available in the online age is being used to enhance and extend the range of techniques for marketing library services.

Marketing, user education and library services should not be regarded as three independant activities but as related activities which complement and support one another, so that each of the three activities can be used as a vehicle for one or more of the others. For example user education sessions can be one of the most effective means of marketing and increasing the use of library services by alerting users to new aspects of the service or adding to their knowledge by introducing related services while marketing and user education are often included as an integral part of the library services. Post purchase marketing of computer based systems, equipment or software by good instruction manuals or training packages will make sure the user can operate them happily and so ensure a positive attitude to their continuing use in his library.

Besides new marketing techniques being introduced as a result of new technology the older conventional marketing techniques are evolving to take advantage of the new formats available in the online age. Thus conventional marketing techniques such as mail shots, flyers, adverts, posters, talks, visits and courses are being augmented by electronic versions of the same techniques.

1. PRESTEL VIEWDATA System

I shall take the PRESTEL viewdata system as my first example of a new medium where many of the traditional aids to marketing have been transformed into electronic form. PRESTEL is an interactive information service developed by British Telecom which allows subscribers online access to a large database of information on a variety of topics, via the public telephone network, using a modified television set and key pad. The British Library (BL) provides PRESTEL pages for public information, marketing and user education.

1.1 Basic Marketing Information

The British Library provides on PRESTEL basic information aimed at alerting the public to the range of services offered by the BL, giving basic information such as holdings, opening times, conditions of admission etc. These pages include marketing information about services, publications and courses.

In addition, each Division of the BL provides more detailed information about specific services and specific publications, so that users with very specific interests can zoom in onto these. An important service will often be introduced with a poster page giving a striking visual impact. eg. the first page of the BIOTEL service described in the next section.

1.2 Services

Bibliographic services provide not only a current awareness service but encourage the use both of the publications listed and of the libraries that hold them. An example of a new bibliographic service on PRESTEL is BISTEL, the SRL's Business Information Service on PRESTEL. This is a current awareness service for new business holdings at the Science Reference Library (SRL) and lists newly received directories, trade journals, market research reports and industry surveys. Entries in the list include the shelf location mark to help readers locate the publication on the shelves.

Another SRL service on PRESTEL, which aims to increase awareness and use of information on biotechnology is BIOTEL. BIOTEL, which forms part of the European Biotechnology Information Project (EBIP) based at the Science Reference Library, functions as an information and current awareness service, giving brief information about events and literature of interest to biotechnologists. There are six elements to BIOTEL: a file of forthcoming conferences; a guide to market research reports, a section on keeping up to date which lists main newsletters and abstracts journals in the field: a short file of news items from recent newsletters; a guide to sources of company information, and details of new books and serials.

1.3 Teleshopping

An increasingly used development on PRESTEL is the response frame facility which allows users to engage in teleshopping and so add to the value of marketing pages.

Teleshopping on PRESTEL works as follows. At an appropriate point in a page users are invited to order a publication by pressing a digit on their key pad. When they do this they are taken to a predesigned form which requests the British Library to send them the publication, the computer will automatically insert the name and address of the user from the computer registry. The user is then asked to press key no 1 to confirm the request or if he changes his mind press no 2 to cancel the request. As soon as he presses number 1 his request is transferred to the British Library file of messages on PRESTEL and can be accessed immediately. The response frames are used by the British Library to encourage users to order a wide range of marketing leaflets and publications, for example, introductory leaflets for the Science Reference Library, or Business Information Service, SRL's list of publications or individual publications, such as "Keeping up to date in Biotechnology" and "Finding out about Biotechnology Companies available through BIOTEL". We have found response frames an effective method of marketing. This year, for example, over a period of about 2 months they generated more requests for marketing brochures than did a recent advert placed in a large-circulation scientific journal. They have the added advantage that once inserted they appear continuously until we decide to remove them.

An additional form of marketing available on PRESTEL is that space may be rented for advertising on the front "Welcome" page which all persons using PRESTEL must see when they log on.

1.4 Computer Aided Instruction

The menu selecting structure of PRESTEL lends itself readily to the design of computer aided instruction courses. Examples of these are the courses mounted by the British Library which aim to teach the basics of using BLAISE (the British Library Automated Information Service). The courses are self instructional and are designed to be modular in format. Modules consist of information frames followed by test frames to allow the user to check his understanding of the course and to reinforce the concepts presented in the information frames.

1.5 Mailbox

A new and increasingly used feature of PRESTEL is the mailbox electronic mail system which allows subscribers to send messages to each other. This is used for enquiries, ordering publications, requests for application forms for courses and general enquiries. Since there is a directory of subscribers with their Mailbox numbers it is also being used for general marketing mailshots. Some subscribers have already developed the use of

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micros linked to PRESTEL sets to store mailing lists and automatically send out marketing information to groups of subscribers.

1.6 Electronic Publishing

An important part of marketing library services is making sure users are alerted to new services and holdings and changes to existing ones. Many libraries have newsletters to fulfill this function and indeed for many it is their main organ for publicity. For some considerable time there have been electronic journals on PRESTEL and the British Library pages have long included news pages. The Science Reference Library provides an electronic version of SRL News which consists of items selected from each issue condensed to a format suitable for PRESTEL. It is available on PRESTEL some weeks before the printed version reaches readers, for example, this year's June issue was available in mid May.

1.7 Costs

Costs of using PRESTEL are standing charges of £5 per quarter for domestic users, £16.50 per quarter for business users. In addition, computer costs are 5p per minute, 8AM to 6PM, Monday to Friday, and 8AM to 1PM Saturday; the rest of the time computer costs are free. In addition, information providers may impose a page charge for each page accessed, though many pages, including the British Library pages, are free. Normal telephone charges also apply although 94 % of subscribers can dial up at local call rates. There is no additional charge for using the electronic mailbox. Information providers pay a tariff of £6500 per year, though many pay less by renting pages from larger organisations. The information provider also pays 4p each time someone requests information using a response frame.

2. Other technological developments

Many of the marketing and training features being used on PRESTEL are also available from other sources and some of these are described briefly below.

2.1 Online Services

Most of the major online services include facilities which can be used for online marketing or training purposes. Online news flashes and newsletters are commonly used for marketing online services, printed publications and courses. Many have special training facilities: An example of computer aided instruction online is the US National Library of Medicine's MEDLEARN, a self instructional course which aims to teach the use of MEDLINE. The more traditional side of online services can often be useful for conventional marketing, for example, we had a good response by including marketing leaflets about new patents courses in computer printout sent to people who had patents searches carried out by our Computer Search Service.

2.2 Facsimile

Facsimile (FAX), a developing service, is used by the British Library in SRL's Phone-in Fax-out service, in BLLD's Urgent Action Service, and as a supplier in DIALOG's DIALORDER service for rapid transmission of copies of documents to clients. With its facilities for transmitting diagrams and polling (sending the same document to several people) it clearly has potential for marketing but is little used for such at present. It will be interesting to see whether the new image and fax based computer filing devices such as Toshiba's Tosfile and Wang's PIC system which combines image processing with word processing, data processing, graphics and communications packages will lead to greater use of this method.

2.3 Downloading

Downloading is a feature, increasingly being used by online and other services, where data or software are transferred either from central computers via telephone lines, or broadcast from videotex services to local microcomputer storage. As part of its computer literacy project the BBC provided downloading of software from TV to domestic micros and software has also been downloaded from PRESTEL and other Videotex services. The aim here was to market and encourage the use of micros as a national educational project. Derwent are marketing a software package, for use on microcomputers, which would allow manipulation and statistical analysis of patents data downloaded after an online search.

Trade literature and catalogues are important sources of business information and the downloading of such data, with the software to manipulate and display it, is potentially a powerful method of marketing.

2.4 Video and Audio Tapes

It is not uncommon to find audio and video tapes being used for marketing purposes. The trade literature collected by the Business Information Service at the Science Reference Library includes examples of such tapes used to give information on industrial products. Future collections of such literature are likely to be augmented by floppy or video discs.

2.5 Interactive Video

This new development connects audiovisuals with computers and allows a programme to combine text, graphics and video on one colour screen at the same time. The aim is to allow each individual viewer (or group) to take the most relevant route through the programme and interact with it as it unfolds. The Open University has prepared three teaching programmes and IBM have developed a marketing programme to demonstrate the use of personal computers. Most current programmes are for teaching and marketing, but the technique has possibilities for visual database information services.

2.6 Electronic mail

European PTTS are now going into public electronic mail systems such as the Telecom Gold system in the UK which is a version of ITT's DIALCOM system. Although limited in its use at present, this has already been used for mailshots and even "junk" mail, that is mail which is unsolicited and unwanted.

2.7 Telex Links

Both Telecom Gold and PRESTEL Mailbox electronic mail systems have telex links which allow messages to be compiled on the electronic mail system and sent to people who do not subscribe to the electronic mail system but do have telex receivers. This also means that users with PRESTEL sets may send messages direct to British Library (or other) telex machines. This extends the marketing potential of the electronic mail systems.

Sending telex-to-telex mailshots is already a common feature of the ordinary telex system, and this is being extended to the electronic mail links with telex.

2.8 Micros

The use of micros for teaching the use of online systems was one of their earliest applications, and the trend is towards software packages such as Acorn Microtex, which are specially written for such purposes.

Much very good software has been written, especially by library schools, to teach students online searching either by programmed instruction or simulation techniques. With the expansion of the home computer, packages are now available for instruction in languages, general subjects, open university courses etc and it should not be too long before floppy disks become part of the marketing packages being mailed to users.

2.9 Video disks

Video disks are already being used for trade catalogues and marketing literature and with their large storage capacity and individual frame capability will, with suitable auxiliary software, be a powerful future medium for marketing and training.

USER EDUCATION: GETTING OUR PRIORITIES RIGHT

Blaise Cronin

ASLIB, London, U.K.

Abstract

Should library patrons be educated, or should their access to, and use of, information systems and services be wherever possible mediated by trained information workers? Should the profession concentrate its efforts on designing 'self-explanatory' libraries and information support systems, or should it accept in advance the futility of such endeavours and instead channel its energies into the development of more sophisticated and expensive user education initiatives? Will the emergence of customised, 'idiot-proof' software obviate the need for user education programmes, or will the expanding web of information systems, networks and protocols create a new, value-added role for the professional intermediary community? Was Charles Moritz correct when he said: "Software is the bridge between technology and customers. Customers don't want technology, they want solutions to their problems. And software is that linkage."? Should the profession move beyond the prevailing concept of user education (which is tactical in character) and concern itself instead with macro-level sensitization programmes targeted, not at individual users, but at funders, opinion leaders, politicians etc.? Has the time come for a change of gear ... for the development of strategic user education programmes?

1. Ten years on

John Lubans published the first edition of *Educating the library user* in 1974 [1]. It was a book I read as a student with considerable interest. Ten years on and I find myself at a conference with the title *Library user education in the online age*, but somewhat cautious in my assessment of the benefits and effectiveness of the last decade's endeavour in this area. We are, I think, beginning to witness the first signs of disenchantment with library user education research projects and programmes. I detect a more questioning, more sceptical attitude among many of my colleagues - an attitude which is percolating to the professional literature.

Perhaps this is only to be expected: professional trends and ideas, like sartorial fashion, follow a fairly predictable pattern of adoption, widespread acceptance and a gradual falling out of favour. Library user education now seems to be sliding out of popularity after a very successful innings. That is not to say that user education will over night become a thing of the past: it is quite likely that it will regain the ascendant under a slightly different guise with a more vogue label. Ideas, like fashion, can have multiple life-cycles. User education may be down, but it is certainly not out for the count.

There is something missionary about the profession's promotion of the library user education creed. Fundamental is the desire to impart enlightenment; to make available to others less fortunate than ourselves the keys to the bibliographic kingdom. A cynic might suggest that the library user education creed is an attempt to construct an elaborate professional self-justification - a facade of altruistic concern.

2. A sound investment?

Over the years a considerable sum of money has been invested in library user education projects. Not everyone is convinced that this is money well spent. Maurice Line has gone on record as saying that "one accessible, informed and helpful information officer is worth a dozen user education programmes" [2]. My own feeling is that the scale of the investment has not been matched by the conclusivity of the results, the concern for accountability or the benefits derived by the assumed beneficiaries of user education programmes.

Militarily speaking, we have tended to concentrate on tactical as opposed to strategic issues. As a general rule we have focussed on the needs of the rank and file and on specific library tasks, activities or functions (e.g. how to use a catalogue; sources of subject information; running an online search). The emphasis has been on relatively low-level skills training programmes for the user Lumpenproletariat rather than strategic sensitisation for opinion leaders, gatekeepers or institutional directors. We have, so to speak, attempted to push up awareness through the ranks instead of first converting the top brass and creating a cascade of awareness and receptivity down the pyramid.

I had just started to think about the sorts of things I might say at this conference when I stumbled across Ray Lester's article User education in the online age. Such titular congruence augured well - too well, in fact, because most of my gestating ideas had already been brought to life by Lester [3]. Throughout his paper I found myself nodding in agreement, not least with his conclusion that there should be a moratorium on "the allocation of public funds to research on, or provision of, 'user education' for the non-information disadvantaged people".

Would library user education programmes have been necessary had libraries and information services/products been easier to use? Probably not - or at least not to the same extent. Library user education is predicated on the assumption that libraries can be difficult to use, that this inhibits the overall level of use and that by providing systematic guidance and tutelage we are doing the would-be user a favour. Library user education is the institutionalisation of the self-help ideal. The aim, crudely, is to 'kick start' the user, point him in the right direction and leave him to his own devices. I sometimes wonder what we could have done with all the money which has been chanelled into user education had it been devoted to the design of more accessible and more user-friendly information systems and services.

According to Lester, the "prime dichotomy in 'user education' has always been between those who feel that the aim of user education should be to teach present and prospective users of libraries how to be as good as a good librarian at finding information; and those who feel that this aim for almost all users is quite inappropriate, and who feel that there will always be a need for librarians to act positively in finding the information users need - at the time and in the place that they need it". Speaking as an outsider, I confess that I find myself aligned with Lester in the second camp. Since this conference is (I presume) a gathering of the converted, the onus is on me to explain and defend this position. I, therefore, propose to discuss the notion of the 'online age' and why at such time a new approach to the marketing of information services is called for.

3. The online age

User education was around long before online became a fact of daily life. Nevertheless, developments in online, particularly within the last decade, have provided the catalyst for much recent experimentation in library user education. The reason for this is not hard to grasp. Information technology in the 1970s was something of a novelty, and few library users had experience of, or exposure to, the new technology either within or outside a library context. Naturally, the profession was concerned that the new tools and techniques should be widely promoted, and users provided with appropriate hands-on training. During the 1970s the British Library Research & Development Department (BLR & DD) sponsored a host of initiatives and training schemes. Thanks to BLR & DD's commitment online was introduced into both academic and public libraries, and support given to schools of librarianship and information science to ensure that students were given appropriate practical experience of online searching.

By the end of the 1970s the online database market had grown enormously. Today there are probably more than 1,000 commercially available databases worldwide on offer from more than 200 hosts. The online information industry continues to grow apace, and a recent report predicts that the online market in Europe alone will by 1987 generate revenues of $1,777.2m [4].

We are rapidly moving from a situation of novelty to one of saturation. While online was a novelty and users relatively ignorant of the possibilities there was a case for systematic user education programmes. As online searching becomes a routine activity the need for library-sponsored induction and training initiatives will become decreasingly important.

Furthermore, as the cost of computer hardware and software continues to fall, as systems become progressively more user-cordial and as the modal level of computer literacy rises, the need for library user education in this area will wane. Already in the UK every secondary school has at least one microcomputer, and the government is currently extending its scheme to ensure that every primary school in the country has its own micro. In France the '100,000 micros' scheme aims to achieve similar blanket coverage. It is, no doubt, a sign of the times that all prospective freshmen at Carnegie Mellon University in the US are required to have their own personal computer - just as some years ago they would have had a slide rule or pocket calculator.

The next generation of entrants to our institutes of higher education will have a sound grasp of the basics of computing and information technology. Recently, I was involved in a BLR & DD-funded project which piloted the introduction of computerised information retrieval in a number of secondary schools [5]. This, I suppose, could be described as a form of user education. What we found was that even the youngest and less gifted children could fairly quickly comprehend the fundamentals of online information retrieval using a microcomputer. We found little evidence of technophobia - fear of computers and keyboards. This would seem to suggest that future generations of library users will be informationally self-reliant and technologically competent in a way that, for instance, my generation was not. We have, in effect, begun to create the conditions which will make library user education programmes superfluous in the long term.

4. Two scenarios

All very well in theory, I hear you say, but in actuality the situation is rather less clear-cut. Do librarians not have a role in guiding users through the maze of commercially available databases, the multiple command languages, the different logon procedures and the cost options which exist, and has not the proliferation of systems guarenteed that even the most enlightened and keenest user of bibliographic information utilities is likely at times to be overwhelmed? The answer, I suppose, is 'yes' ... but the solution need not take the form of more, or even better, library user education programmes. There are at least two alternative scenarios.

Let us assume that not all traditional library users are willing or able to help themselves. Should our aim be to help them become self-reliant, or should we concentrate on promoting ourselves as the professional intermediaries? Like Lester, I am inclined to favour the latter approach, at least in those situations where a particular constituency of users clearly does not want to do the donkey work itself. Since we have the expertise, the time to keep abreast of developments in the information world and are in fact paid to mediate in the transfer of information, there is a strong argument for not wasting the user's time or under-utilizing our own skills.

In the longer term the technology itself may become so simple to operate that users will not need to be educated: the technology will train the user to take full advantage of its capabilities. There are heartening signs that technology push is giving way to demand pull, and future generations of Information Technology will be designed with the needs, preferences and competencies of the ultimate user firmly in mind.

Using interactive cable TV, citizens in Columbus Ohio subscribing to the QUBE system can call up the catalogue of the local library online from terminals in their home and order books directly, which will then be delivered to their doorsteps. Increasingly, we shall see library/information systems constructed with the user's rather than the expert's convenience in mind. In the UK 11 % of all households have a microcomputer. Similar market penetration has been (or soon will be) achieved in other developed countries, and this is creating an entirely new domestic consumer group. Until recently online bibliographic services were targeted at the traditional intermediary community (librarians and information specialists), but now the information industry is looking to the non-specialist (professional) market for new growth opportunities.

In 1983 both BRS and DIALOG (two of the major online vendors) realised that the proliferation of home computers constituted a major market opportunity and accordingly launched their non-prime-time information retrieval services - BRS After Dark and DIALOG Knowledge Index. Both systems are appreciably easier to use than their prime-time equivalents; in both cases the user need only learn a few simple commands. The vendors' pricing policies also make them appealing to the non-specialist user. Typically a user would spend $5 for a search producing a 40 item print-out. Early indications suggest that the systems have been enthusiastically received, and their future seems rosy. A recent review in Online concluded that "the electronic home library will very likely be fully established, in literally millions of homes and offices in the U.S. and Canada. Personal computing, videotex, teletext and videodisc mass storage will all be common and widely available" [6].

Other players on the information stage have recognised the latent demand for easy-to-use information retrieval and database management software. The Institute for Scientific Information (ISI) recently unveiled Sci-Mate which allows the user to search DIALOG, SDC, BRS, MEDLINE and ISI databases using a single command language. The system offers a common command language, automatic dial-up and logon, and a menu-driven search system. In addition, there is a Personal Data Manager facility which permits the user to turn any text file into a personalised mini database.

In future, database producers are likely to give more attention to the needs of the do-it-yourself information market by, for example, making their files available on floppy disks for the convenience of the non-institutional user who prefers local processing to telecommunications-based data access. Technical and marketing developments of these kinds can only result in greater end-user access to both primary and secondary sources of information. In particular, the trend to full-text retrieval will in due course shift the centre of economic activity from the traditional intermediary community to the universe of end-users.

In considering how technology might 'liberalise' access to information, mention ought to be made of expert systems. Some of the possible library/information applications to which expert systems might be put (e.g. cataloguing) will not directly impinge on users, but there are other areas in which the impact of expert systems could lead eventually to greater user autonomy. One can, for instance, imagine expert systems being used to guide or orientate the user in a large library, to explain the workings and layout of the library, to answer basic reference questions or to refer the user to more appropriate sources and centres of information. For the present, however, these constitute the potential rather than the actual [7].

To date the most interesting applications have been to do with the design of 'idiot proof' front end systems which permit untrained users to search databases online without having to learn a command language, use a manual, or call upon the assistance of a trained intermediary. One of the best known examples of this kind of system is PAPERCHASE, which was installed in a hospital for use by medical staff (students, house officers and practising physicians). The naive user merely pressed a clearly labelled key on the terminal and thereafter was guided by the system though the search formulation and refinement stages to an evaluation of the resultant output. Over the trial period the system's popularity exceeded expectations, and a significant degree of repeat usage was recorded among individuals with no prior online experience [8].

PAPERCHASE, I should just add, is but one of a growing number of front end systems which obviate the need for library user education in this particular area.

Allowing for the sake of illustration that technology develops along the lines I am suggesting and, further, that this creates a situation in which library user education programmes of the kind we have fashioned in recent years become largely irrelevant, what then should we be doing instead - where should we be directing our energies - what new activities and responsibilities should we be taking on board?

5. User education as marketing

The answer, I think, turns on our interpretation of how we market ourselves - and to whom. Much has been written on the marketing of library and information services in general, and on the marketing of online services in particular. What I should like to do now is consider library user education as a marketing strategy in its own right. Why do we educate our users? We do it for a variety of reasons, such as the desire to pass on the benefits of our own experience, to open users' eyes to sources of information, to optimise the use made of costly information services, to enable users to carry out their researches more effectively, and so on. But basically we are trying to satisfy our users. We are, in marketing parlance, engaged in customer satisfaction engineering.

Marketing is, however, a two-fold activity which involves resource attraction and resource allocation. By and large the library profession has concentrated on the allocation process -utilising plant, resources, and facilities in such a way as to bring the greatest satisfaction to the greatest possible number of users. One of the enabling mechanisms we have employed is library user education. By educating users in the use of catalogues, bibliographies, indexes, online services etc. we hope to maximise the satisfaction and benefit they derive from the services on offer. In developing expertise in this area we have tended to ignore the process of resource attraction - the logically antecedent activity.

As well as marketing our services to our various user communities, we have also to market ourselves and our services to those who control the purse strings - the funders. At the risk of oversimplifying, resource allocation focuses attention on the rank and file user population, while resource attraction shifts the focus to the top brass (to employ the terms I used earlier).

Aggressive marketing at the user end is all very fine, but a successful marketing campaign can, of course, increase demand to such a level that without extra resources there will be a decline in the quality of the service provided. If additional funds are not forthcoming, then caution is advised. If extra funds are required, then the marketing thrust will have to be directed at the funders of the service. As a recent LISC (Library & Information Services Council) report on user education noted, funder education needs to be considered in conjunction with the education of users[9].

In effect, what I am talking about is macro user education. Our first objective should be to sensitize influential figures in our parent organisation, institution or local operating environment to the importance of information as a resource and of the need for effective management and exploitation of that resource. We need to develop broad awareness campaigns rather than attempt to promote the latest piece of technology, specific types or classes of information or particular professional skills which we happen to possess. Our aim, in a nutshell, should be to 'sell' the benefits of effective information management to those ultimately responsible for policy and financial decision making in our spheres of activity.

6. Information as a commodity

Information is pervasive. The information explosion, first quantified in the 1950s and 1960s, shows no sign of abating. An ever-increasing proportion of the economically active are engaged in information-related occupations - generating, storing, manipulating, refining, retrieving, integrating, marketing, packaging, communicating or distributing information.

Governments and individual organisations have come to recognise that information is a key resource - like capital or energy. Information has, indeed, become 'Big Business', a fact testified to by the growing involvement of the private sector in the development and marketing of information products and services. National governments, too, have come to recognise that information is an important social resource and have accordingly launched awareness programmes of one kind and another. In the UK, there have been a number of government-sponsored sensitization programmes and considerable sums have been spent on developing skills nationally in information technology and related areas. Further impetus has come from a recently published Cabinet Office report Making a business of information, which introduced the concept of 'tradeable information' into everyday speech and helped highlight the growing importance of information in balance of trade figures [10]. Clearly, a climate of acceptance exists, and we should endeavour to capitalise on the fact by promoting ourselves and our skills as managers of this key social resource.

So far so good. But merely parroting that information is good for you is unlikely to have the desired effect. We shall have to identify the pay-offs to the funders/users. In marketing terms, we need to emphasize the benefits to be derived from a commitment to the 'information ethic'. The goodness of information will not always be self-evident with the result that a product-centred approach to information marketing is unlikely to produce dividends. Rather than dwell on the inherent goodness and value of information qua information, or eulogize about the wizardry of the support technologies at our disposal, we ought to market information in terms of the benefits to be gained by our target audiences. At the general level, we could instance the following:

- investment in information assists in new product development
- information is the basis of innovation
- effective information management enables an organisation to anticipate trends in the external environment
- an organisation's internal efficiency depends on effective control and integration of existing information systems
- information is a prerequisite of intelligent market positioning
- effective information management improves communication within organisations
- information helps people work more effectively
- effective management of information can save money and eliminate duplication of effort
- access to information enables individuals to function more effectively in society
- information is a raw material which can be refined and sold at a profit

7. Conclusion

In giving this talk the title *User education: getting our priorities right* I wanted to draw attention to the need for macro level user education. We have, as a profession, developed and polished an impressive array of methods and techniques for educating rank and file users, but we have to some extent neglected to market ourselves, and our skills as managers of a key resource to the top brass. In the online age, with its new challenges and tensions, the time is right to focus more on the strategic issues, and to make sure that we educate those who matter most - the funders.

References

1. LUBANS, J., ed. *Educating the library user*. London, Bowker, 1974. 435p.
2. LINE, M.B. Thoughts of a non-user, non-educator. In: Fox, P. & Malley, I. eds. *Third International Conference on User Education, University of Edinburgh, 19-22 July, 1983.* Loughborough: INFUSE Publications, 1983.
3. LESTER, R. User education in the online age. *Aslib Proceedings*, vol.36 (1984) no.2, pp. 96-112.
4. Frost & Sullivan market report cited in: *Infotecture*, vol.29 (1983) no. 4.
5. ROWBOTTOM, M.E., PAYNE, A.W. & CRONIN, B., The Schools' Information Retrieval (SIR) Projects. London, British Library, 1983. (LIR Report No.15)
6. JANKE, R.V. BRS/After Dark: the birth of online self-service. *Online*, vol. 7 (1983) no. 5, pp. 12-29.
7. CLARKE, A. & CRONIN, B. Expert systems and library/information work. *Journal of Librarianship*, vol. 15 (1983) no.4, pp. 277-292.
8. HOROWITZ, G.L. & BLEICH, H.L. Paperchase: a computer program to search the medical literature. *New England Journal of Medicine*, vol. 305 (1981) no. 16, pp. 924-930.
9. Library & Information Services Council. *User education: a discussion paper*. London, Office of Arts & Libraries, 1983. (Unpublished paper).
10. Cabinet Office. *Making a business of information: a survey of new opportunities.* A report of the Information Technology Advisory Panel. London, HMSO, 1983.

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TRADE-OFFS IN THE DESIGN OF AN ONLINE PUBLIC ACCESS CATALOG, EXAMPLIFIED BY VUBIS

Marc O.L. Verpoorten

Eindhoven University of Technology Library, Eindhoven, The Netherlands

Abstract

The design of an online public access catalog (OPAC) involves the weighing of numerous trade-offs for which no simple answers, no easy solutions, are available. The choices are determined by such issues as the kind of library - technical, universal, public, etc. -, the collection size and type, the extent to which schooled staff is available to assist patrons during the searches, etc.

I. Introduction

The interest in online public access catalogs is clearly growing: whereas actual applications were rare up to a few years ago, the number of applications seems to increase rapidly. C.L. Jones[1] reports that in the US there were less than 20 applications in 1980, almost 300 by mid 1983. The reasons for this are many and complex. Let me enumerate a few here:

1. Drop in hardware prices (every 3-5 years the ratio power/price doubles). As a consequence, minicomputers can now perform jobs previously assigned to mainframes; microcomputers may well achieve now what minis did years ago. All this has led to the situation in which library administrators can consider and afford dedicated library automation systems.

2. As library automation in whatever form begins to affect library operations on a truly universal scale, more and more libraries have catalog records available in machine readable form.

3. On the other hand, the cost of maintaining manual catalogs continues to increase; institutions which opted for COM catalogs in the past are confronted now by the rising cost of updating ever growing files and by the problems for their users to handle large numbers of COM fiches.

4. Library patrons are frequently confronted with online applications elsewhere and may wonder why the library has not followed suit. There may be a paradox here, in the sense that while computer applications may no longer frighten, especially the young, very many have not as yet worked directly with online systems themselves.

5. Fashion, a snowball effect, may explain the present interest in OPAC.

6. Experience and research indicate that, in general, users approve OPAC. The Council on Library Resources sponsored a coordinate study [2] on user responses to OPAC, executed by 5 different organizations. The research was carried out in 1982, encompassing 29 American libraries, representing 15 distinct systems. Some 12,000 users were questioned in terms of their experiences, preferences, etc. A full 75 % of users prefer OPAC over manual searches; roughly 80 % claim to have found relevant information; more than 80 % again express favourable attitude towards OPAC; only 9 % actually claimed to prefer a card catalog.

Now, as we already suggested, there are at this moment a great number of OPACs in operation, in the US, in Europe and elsewhere. In a paper by S.R. Salmon[3] 20 different such systems are analysed and compared. Here follow some of his conclusions:

1. While permitting author, title and subject searches without exception, these various systems offer widely differing search possibilities, including or excluding the options of:

- Boolean searches
- Access by ISBN or LC number
  by corporate authorship
  by uniform entries of various kinds
  by series title
- Limiting or expanding search results capabilities
- Print-out capabilities
- Alternative display formats of bibliographical description (bd) (some being restricted to the presentation of MARC format only!)

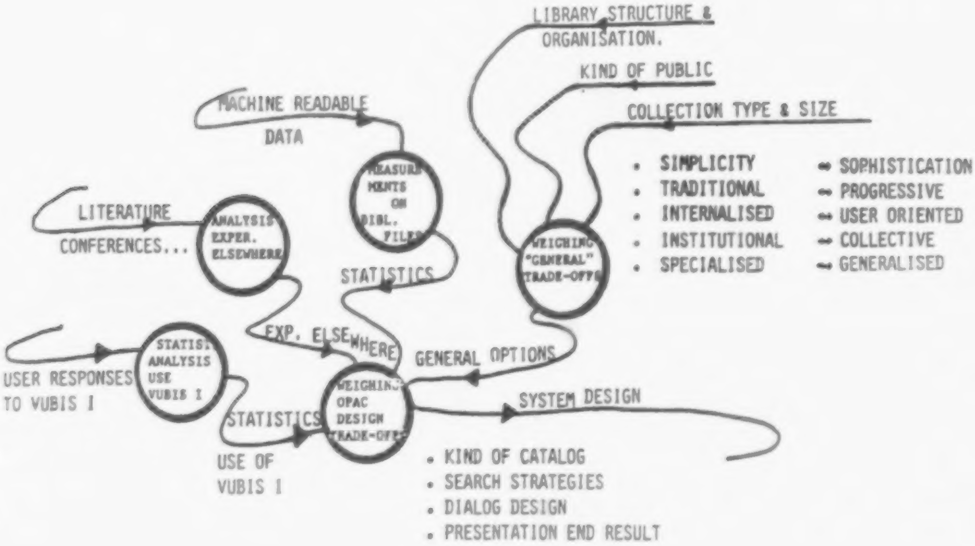
2. In general, some systems are "command" driven, others are "menu" driven.

Thus we recognize a great number of options, which I propose to call "TRADE-OFFS" in this presentation. These trade-offs are not necessarily either/or propositions (although they can be that). For example, the choice may not be between Boolean searches or no Boolean searches, but between certain kinds of such searches. The same applies to virtually all parameters of Saimon's text. The trade-offs we are concerned with seem to lie on a continuum therefore, the choice not being always either/or, as how much and of what kind.

I have been associated with OPACs since 1975, the year in which we started the development of VUBIS, a system designed as an integrated online library information system. We have taken the OPAC function as the central concern of the design: all other functions (including and especially the cataloging) were planned from the viewpoint of the OPAC.[4] The core bibliographical system (containing the OPAC and cataloging functions) has been operational in the VUB (Free University of Brussels) since the end of 1977. At this time, the VUB, the EUT (Eindhoven University of Technology) and the Eindhoven Public Library are in the process of developing a second version of VUBIS in which the weighing of various trade-offs, especially in relation to the new OPAC function, has concerned us for years.

II. Overview of the presentation

I have tried to present on a graph the different parts of my presentation and the relationships between them.


LIBRARY STRUCTURE & ORGANISATION.
KIND OF PUBLIC
COLLECTION TYPE & SIZE
MACHINE READABLE DATA
MEASUREMENTS ON BIBL. FILES
LITERATURE
CONFERENCES...
ANALYSIS EXPER. ELSEWHERE
STATISTICS
WEIGHING "GENERAL" TRADE-OFFS
• SIMPLICITY ↔ SOPHISTICATION
• TRADITIONAL ↔ PROGRESSIVE
• INTERNALISED ↔ USER ORIENTED
• INSTITUTIONAL ↔ COLLECTIVE
• SPECIALISED ↔ GENERALISED
EXP. ELSEWHERE
GENERAL OPTIONS
USER RESPONSES TO VUBIS I
STATIST. ANALYSIS USE VUBIS I
STATISTICS
USE OF VUBIS I
WEIGHING OPAC DESIGN TRADE-OFFS
SYSTEM DESIGN
• KIND OF CATALOG
• SEARCH STRATEGIES
• DIALOG DESIGN
• PRESENTATION END RESULT

The weighing of trade-offs related to OPAC design is represented on this graph in the lower circle. The output of this activity is the system design, in other words, once the answers are provided to all the questions posed in this circle, the system development can start, so to speak. I classified these trade-offs into four categories:

1. Trade-offs related to the 'kind of catalog' offered to the public, more specifically questions like: does the user search in an integrated institutional catalog or in partial catalogs, containing descriptions of works locally held only; are descriptions of different kinds of materials integrated (audiovisual works together with books); in what kind of typography are the bd presented to the public; does the system also provide administrative information, such as loan and acquisition information?

2. The second catagory of trade-offs concern search strategies, more specifically questions concerning the kind of search keys that will be provided to the public (author, title, title words, search keys containing Boolean operators).

3. Once the search strategies are decided upon, the problem comes of designing dialogs to conduct the searches. Here questions arise like: are 'menu' or 'command' driven searches preferable, are multilingual searches needed, how are helpmessages handled and the like.

4. And then the last category: trade-offs concerning the presentation of the end-result. In what kinds of formats are the bd shown to the public; how does the system handle the relationships between them?

The answers to these specific questions are in part determined by choices in trade-offs of a clearly more general, almost ideological character which concern general options and characteristics of the library information systems as a whole. The most important questions of that kind are listed on the right hand side of the graph : simplicity versus sophistication, traditional versus progressive, etc. Now, the problem is that no decision, ideological or other, can be viewed as an independent variable. It is our experience that every single choice affects the next. Thus we are concerned with a highly complex series of integrated problems, and only a sophisticated decision model could do justice to the complexity of the proposition. The resolution of these more general trade-offs depends on the particular library context. Information on the collection type and size, for instance, the kind of public, library structure and organisation, will influence this decision making process.

Not only these general options play a role in the weighing of trade-offs specifically related to OPAC design. Libraries that plan to implement an OPAC are likely to possess machine readable bibliographical records, on which numerous statistical measurements can be performed, the results of which play a role again in the weighing of the OPAC design trade-offs. Experience elsewhere, communicated in the literature and at conferences like the one you attend right now, can also support this decision making process. And finally - but this applies only to our specific situation - information on how the patrons reacted in the past 6 years to the OPAC of VUBIS I, has played a considerable role in the weighing of the OPAC design trade-offs for the VUBIS II system.

What I propose now is to focus first on these more specific OPAC related trade-offs - thereby discussing the results of some of the statistical measurements we performed on our files and on the use of VUBIS I at the VUB - and then, as a kind of a conclusion, discuss the more general trade-offs. (Discussing these general trade-offs first would turn out to be a very abstract exercise, I am afraid).

III. OPAC design related trade-offs

A. Type of catalog

Let us tackle the first category of trade-offs related to OPAC design. There are 4 basic questions concerning the type of catalog offered to the public:

1. Institutional (union) catalog versus local catalog.
2. Integrate all library materials in a single catalog (e.g. also audio-visual materials)?
3. Is administrative information shown to the public?
4. Typography.

1. The first question seems to be one of function. Is the OPAC primarily designed to be an instrument for identifying locally available materials (for instance partial collections within a single library) or for introducing the reader to the largest possible bibliographical universe (e.g. an inter-institutional or union catalog)?

   It is evident that at a time given to networking and all other forms of cooperative inter-institutional schemes, a time also in which large files are technically and economically feasible, there are significant management reasons to pursue the development of integrated bibliographical files. The question remains if the public is served by the availability of large files, posing levels of complexity which may not be justified, at least not for all users, or for all queries. Obviously, this problem has to be approached in a differentiated manner: a different policy is probably needed for scientific than for recreational texts.

   If we opt for an integrated, union type of catalog, and offer searches at all library locations in this file only, it still remains possible to handle a kind of priority scheme, so to speak, in that only for bd of works locally held, are the call number and/or loan information shown. For the other bd identified during the search, this information is then displayed on special request only. Another possibility is to provide at the end of the search the option of limiting the search result to such descriptions which are represented in the desired location. But the question then rises : what are the problems of having the public search in a highly complex environment, where for instance name forms are strongly differentiated, to show as the end product of the search only a very few items which are locally held?

2. The second question is, do we integrate all library materials in a single catalog (e.g. audio-visual materials), thereby making the search less differentiated and probably harder to interpret, or do we separate files, possibly accessible via different clearly marked terminals?

3. Now the third question. There are many reasons why it would be desirable to integrate the OPAC function into a total library information system, incorporating a

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wide array of other technical and administrative functions. In that case it becomes possible, when showing bibliographical data, to incorporate a work's loan status, acquisition data, information on the receipt of single issues (for periodicals), etc. While presenting such information to the public seems inherently valuable, there are a number of difficulties involved as well : (a) it will burden the user with, at times, unwanted information. (b) Showing the amalgamated serial or series holdings of different institutions, together with loan and acquisition data, can add up to a highly complex statement! (c) Furthermore, acquisition data tend to be, bibliographically, of an inferior quality, polluting the files (if temporarily) with variant bibliographical forms. On the other hand, as permanent file size increases, the volume of such imperfect acquisition data will decrease proportionally.

The trade-off does not seem to involve the choice of offering this kind of information as such - according to the CLR study the public wants it, on the whole. It is a matter of finding an adequate procedure whereby OPAC remains sufficiently simple, while offering selectively categories of data which deserve priority.

Related to the foregoing is the possibility of offering reserve functions for loaned items, as well as suggestions for purchase titles as yet absent from the files. Again, factors of cost and increased complexity must be weighed against the potential system usefulness and attractiveness.

4. The last question, typography, remains a basic trade-off. Even though dialogues can be structured in such a fashion that typographical differentiation does not inhibit search results, the system's typography does play an important role in the presentation of bibliographical data. While certain diacritical characters may be transliterated, this is not true for all. Basic here seems the emphasis on the catalog as a finding tool, or as a bibliographical instrument.

B. Search strategies

So much for the trade-offs related to the kind of catalog. Let us discuss now the second category of trade-offs, trade-offs related to search strategies. As you can see, this part of my presentation contains four chapters again:

1. Introduction.
2. Boolean searches.
3. ISBN/LC; mixed search keys.
4. Statistics on use of VUBIS I
   on personal authors and title words for the E.U.T. catalog.

1. As we have seen, all OPACs offer some forms of author, title and subject searches. Theoretically, however, searches are possible by each bibliographical element and by combinations thereof. Obviously, the online environment makes various types of Boolean permutation possible. Very little is known, on the other hand, of the success such techniques have in OPAC. Even the CLR study reports nothing on this matter, other than that readers have shown a considerable adaptive capability, being open in principle to a progressive approach.

2. For VUBIS I we opted for a conservative search strategy, allowing searches by author, title and subject only. The reason is that by 1975, the year that the system was planned, it was not clear at all how the reading public would react to the new technology. We therefore consciously developed an online capability resembling traditional catalog entries.

   User studies of VUBIS I confirmed our assumption that search strategies ought to remain reasonably simple. Measurements on the use of the multiple choice option, which allows the patron to select more than one item (separated by comma) at a time, indicate that this, to our eyes simple, option is rarely used, readers preferring to look at items one by one.

   Nevertheless, even in the case of relatively small collections (100,000 to 300,000 bd) we feel that more powerful search mechanisms may be desirable, although applied on a highly selective basis. If employed properly, such search methods increase the likelihood of successful results.

   Such methods ought to be offered, in our opinion, in addition to - not instead of - traditional search devices. We are convinced that Boolean searches remain conceptually difficult to a large segment of the public.

3. Searches via ISBN or LC number, or mixed keys (four letters title plus four letters author for instance) appear insufficiently user-friendly to us, even though these searches lead to successful results, in principle.

4. In order to be successful, a search has to produce a manageable result, at least whenever a patron is looking for a specific title. He must not be overwhelmed by large quantities of data. To me, that means no more than 48 to 72 bibliographical descriptions, that is 4 to 6 screens with short, one line descriptions. In that case a searched for item would appear on the average on the second or third screen, that means after one or two additional operations, the first 12 descriptions being displayed automatically:

```
Abbreviated descriptions                          Total number of descriptions: 26

 1. Advanced topics in enelasticity and failure of concrete         ** HKH 79 BAZ
 2. Association for computing machinery: Roster of members 1979     ** AEL 79 ASS
 3. Bauten fuer Aus- und Weiterbindung = Buildings for further      ** RIN 64 ARC
 4. Chemical machinery: An elementary treatise on equipment for     ** JNB 44 RIE
 5. A climatological guide for meteosat users                       ** On loan!
 6. Code of practice for structural use of concrete for retrain     ** AHR 70 BSI
 7. Design of arighmetic units for digital computers                ** DDF 80 GOS
 8. Framework for regional planning in developing countries:   ME   ** BSB, BSR
 9. Geometrical methods for the theory of linear systems:   NATO    ** DPC 80 GEO
10. Industrial new product development: a manual for the 1980s      ** WHG 79 CAR
11. The journey to work: Its significance for industrial and co     ** UHJ 44 LIE
12. Measured drawing for architects.                                ** RWW 80 CHI

Choose descriptions:
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As you can see, the descriptions contain some 65 characters of the title and the callnumber. For loaned items an appropriate message is displayed instead.

Using this as a criterion - I repeat, for searches on a specific item only - the usefulness of various access keys in relation to the size of the bibliographical database can be predicted by performing statistical measurements on the frequency of those keys. We carried out such measurements for the personal authors and for the title words of the EUT catalog containing some 200,000 bd.

I would like to comment on the result of these measurements and on some of the statistics on the use of VUBIS I. Furthermore, I would like to discuss with you some possible enhancements of the search strategy.

It may be interesting to investigate which entries VUB users choose in employing the online catalog, including the degree of failures (in which percentage of searches, the search key fails to produce a match).

Use of VUBIS I search modes

Search method	% searches	% fealures
Title	30%	46%
Author	41%	22%
UDC (aided by system or not)	8%	27%
UDC nomenclature	21%	56%

As you can see, users search frequently on author. The VUB handles a UDC subject coverage system and allows searches on UDC numbers as well as on the corresponding UDC nomenclature.

The study of the Council on Library Resources indicates that in the USA more than 50 % of all searches are by subject, although strongly dependent on the type of reader. The difference (only 29 % in VUBIS) may be explained by different educational climates and/or type of catalog. In general, the American student is expected to perform a more independent type of study than the Belgian and Dutch student.

Remarkable is the large volume of failed searches by title and by subject. In the case of subject searches the explanation is evident : patrons have difficulty in handling the controlled indexing vocabulary. Despite the frequency of subject searches in the US, there too, users meet difficulties of all sorts in performing subject searches.

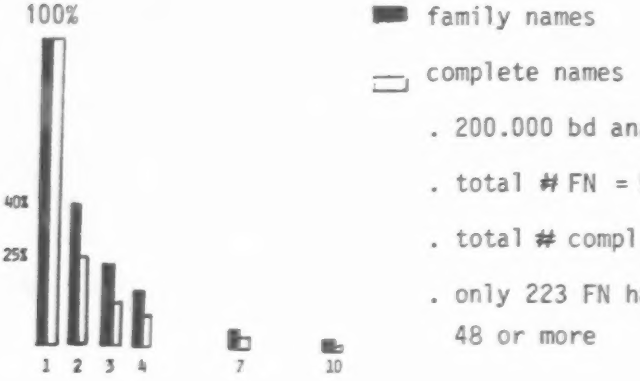
Author searches

I would like to expand a little bit on author searches now.

This search mode is frequently used; the error rate remains low, undoubtedly favourably influenced by some 15 % additional name forms in the author index : these name forms are on the one hand spelling references - for inverted and composed names as well as for names containing diacritics which yield more than one character in the transliteration, extra name forms are created - on the other hand bibliographical references used for standard name forms, pseudonyms, etc.

The analysis of the personal authors of the EUT catalog, containing some 200,000 bd, yield the following results.

Percentage of family names only/complete names having frequencies of x or more



. 200.000 bd analysed

. total # FN = 57.100

. total # compl.names = 103.500

. only 223 FN have frequency 48 or more

We measured the number of surnames and complete names - I mean surname plus first names - having frequencies X or more, and expressed all the results in percentages. Hundred per cent of the family names have frequency 1 or more - they all appear once or more of course, but only 40 % have frequency 2 or more (so, the difference, 60 percent of the family names, have only one description associated with it!) Of course the frequencies for complete names are lower. Needless to say, all this is connected to cataloging practice: the more differentiated the cataloging, the lower the frequencies.

We found that only 223 family names have frequencies of 48 or more. We have investigated to what extent a possible restriction by broad subject term would offer adequate further differentiation for those family names. The idea is that we would offer the public the option of selecting one or more subject determinators out of a list of some 20 such terms, presented to the public only in case the author search produces a volume greater than 48 bd.

BROAD SUBJECT DETERMINATORS

A GENERAL REFERENCE WORKS
B PHILOSOPHY, SCIENCE & TECHNOLOGY
C MATHEMATICS
D COMPUTER SCIENCE, SYSTEMS & CONTROL
E MECHANICAL SCIENCES
G PHYSICAL SCIENCES
H MATERIALS SCIENCE
J CHEMISTRY, CHEMICAL ENGINEERING
K MECHANICAL ENGINEERING
L ELECTRICAL ENGINEERING
M GEOPHYSICS, ASTRONOMY.

P MEDICAL SCIENCES
Q BIOLOGY, ECOLOGY, ENERGY
R CIVIL ENGINEERING, ARCHITECTURE
S URBAN PLANNING, HOUSING, TRAFFIC
T GEOGRAPHY, HISTORY
U SOCIAL SCIENCES, EDUCATION
V LAW, POLITICAL SCIENCES
W INDUSTRIAL ENGINEERING
Y LINGUISTICS, LITERATURE
Z ART, RECREATION

That is a kind of hidden Boolean search. I did not have to draw a graph, since, as was expected, the differentiation is perfect. There is no correlation between family names and subject. There is no reason after all why all Wilsons would publish mathematical books only.

In regard to author searches there are some other trade-offs that should be brought up.

The issue of separating the surname and first name information. In VUBIS the author's search key refers to surname information only. We consider mixed search keys less user-friendly. In many other systems all or part of the first name may be included as well. We feel that one cannot expect the user to handle a kind of delimitor in order to separate the first name information from the surname information. On top of that: Dutch first names are frequently confronted with transposed prefixes! Furthermore, users cannot be expected to know the exact first name form selected by the catalogers. We prefer asking the user to select one or more first name forms from a list presented to him, which assumes a passive knowledge of the first name only.

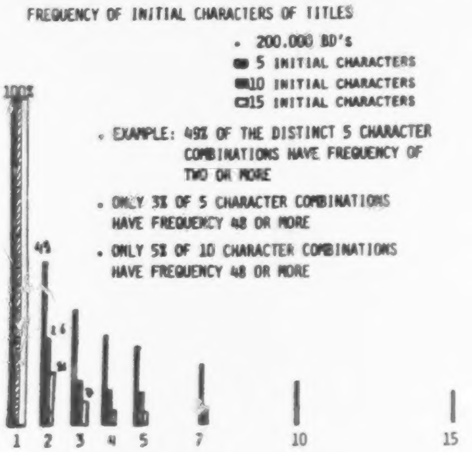
Another issue is the possible differentiation between personal and corporate author searches. If the two searches are separated, the question must be asked to the user whether he wants to search by corporate or by personal author, and I believe most users are like myself before I started to work in a library : confronted with such a question they do not have the vaguest of notions of what is expected from them. Furthermore, corporate authors can include elements of a personal name form, like the Max Planck Institute, thereby further confounding the public. On the other hand, the advantage of separating the two is that the problem of presenting two different categories of authorship is avoided.

Title and title word searches

Let us focus now for a while on title and title word searches.

The large percentage of failures in the case of title searches - some 46 % - seems astonishing, especially since the VUBIS programs are designed in such a way that a number of problem arrays are anticipated, potential difficulties alleviated.

Search failures become more understandable, however, when comparing the length of the actual search keys produced by VUB readers to the 'ideal' length in function of the catalog size. In order to determine this 'ideal' length, we carried out the following experiment on the title file of the EUT catalog (some 175,000 titles were analysed):



- From the initial character strings of titles represented in the file, we selected all different character combinations having a certain length (resp. 5, 10, 15, 20 and 25 characters.)

- We investigated the frequency of each combination of characters.

- We determined the percentage of character combinations of a given length having frequency 1 or more, 2 or more, 3 or more, etc. and, for convenience, drew a graph. The percentages for character combinations of length 20 and 25 were too low to be represented on the graph.

Hundred per cent of the distinct 5, 10, 15 character combinations appear at least once. If a search key of five characters is used, and there is a match, then there is a probability of 51 % that only one title will be associated with the search key. If search keys of 10 characters are used, and there is a match, in some 74 % of cases only one title will be found!

For a database of some 200,000 descriptions the ideal length of the search key seems to lie somewhere between 5 and 10 characters. With search keys of that length the probability of finding 48 descriptions or more is lower than 0.5 %!

Now, if we compare that to the length of title search keys employed by VUB readers, we understand better why there are so many failures with title searches. We measured that length and found that some 40 % of the search keys used by the readers show a length of 20 characters or more, thereby running obviously a great risk of producing typing errors.

On the assumption that not all users actually know the initial words of a title, while remembering a few of its significant elements, we investigated to what extent a word search - meant as an alternative title search, not as a hidden subject search - could be of interest for our users. We therefore performed some word frequency analyses, again on the EUT bibliographical database, and found that:

- for 200,000 bd the resulting wordfile contains some 170,000 words. We used a stoplist, whereby as criterion we did not handle the absolute frequencies of use but conceptual meaning (so the word 'analysis' is not in the stoplist although it may have a frequency of perhaps 566)
- only 1.4 % of the words have a frequency of 48 or more. In the same way as we did with family names, we looked at the possible further differentiation by broad subject determinator and found that some 80 % of words having a frequency of 100 or more differentiate in a perfect way.

Nevertheless, we should be careful with the interpretation of these results. There may be only 1.4 % of words having frequencies of 48 or more - and thus being potential conflicts - we should not forget that precisely because of their high frequency these words are very likely to be used as search key.

C. Dialog design

So far for the trade-offs concerning search strategies. I would like to talk very briefly now about the two other OPAC design related trade-offs: trade-offs concerning dialogue design and trade-offs regarding the presentation of the end result.

- Menu versus command driven system. Menu driven assumes a gradual process. The reader must perform his search within a predetermined strategy. The limited number of options open to him can only partially influence the dynamics of the search process. In the case of command driven systems, the user exercises greater control over the search process. The latter demands from the user more input of a coded nature and great familiarity with the system potentialities.

- Multilingual search process. Independent use implies multilingual dialogs in Europe. More than 10 % of VUB readers choose the English option, 5 % the French. In the science/technology library of the VUB, more than 20 % of patrons dialogue in English.

- Help messages in chosen language. Even though surprisingly few patrons made use of this information facility in VUBIS I, the option must be provided. Then rise questions like: are the help messages displayed on request only and for all categories of users? We must not forget that too much text on a screen confuses the reader. Experienced readers should not be bothered with unneccessary information. In a sense, both showing and not showing contributes to the user-friendliness of the system.

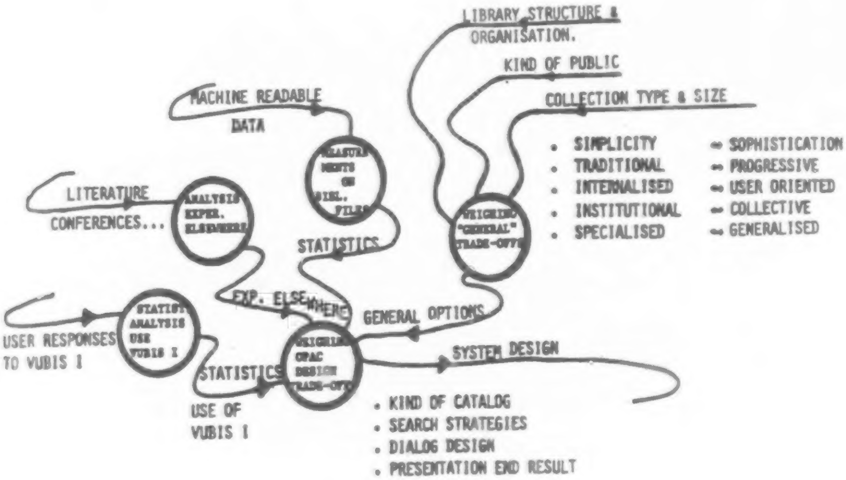
- And then questions like: should numerical or mnemotechnical codes for the options be used? With these questions we enter the study field of ergonomy for computer applications, not typical for library and documentation work. In the same context a great number of questions could be discussed, such as ideal distribution of data on the screen, use of contrast, color, typography, etc.

D. Presentation end-result

- Finally some words about trade-offs regarding the presentation of the end-result, I mean the bd, bibliographical description are essentially complex, often part of a hierarchically structured entity (analytical description are part of monographs, monographs belong to series, etc.) Together with the virtually unlimited number of manipulations that can be performed on machine readable data, this constatation is the basis of a great number of trade-offs again, for which, I am afraid there is no time left to be discussed in detail. I can tell you that we spent literally some man-months discussing these trade-offs, and I am convinced they could be the subject of another speech of 45 (long) minutes.

IV. General OPAC-design related trade-offs

Now as promised, as a kind of conclusion, I would like to discuss some of the more general trade-offs which influence directly most of the choices in the trade-offs specifically related to OPAC design. I already mentioned that these more general trade-offs are of an almost ideological character. They are listed on the right hand side of the graph:


LIBRARY STRUCTURE &
ORGANISATION.
KIND OF PUBLIC
COLLECTION TYPE & SIZE
MACHINE READABLE
DATA
MEASUREMENTS ON BIBL. FILES
LITERATURE
CONFERENCES...
ANALYSIS EXPER. ELSEWHERE
STATISTICS
WEIGHING "GENERAL" TRADE-OFFS
• SIMPLICITY → SOPHISTICATION
• TRADITIONAL → PROGRESSIVE
• INTERNALISED → USER ORIENTED
• INSTITUTIONAL → COLLECTIVE
• SPECIALISED → GENERALISED
EXP. ELSEWHERE
GENERAL OPTIONS
STATIST. ANALYSIS USE VUBIS I
USER RESPONSES
TO VUBIS I
STATISTICS
WEIGHING OPAC DESIGN TRADE-OFFS
SYSTEM DESIGN
USE OF
VUBIS I
• KIND OF CATALOG
• SEARCH STRATEGIES
• DIALOG DESIGN
• PRESENTATION END RESULT

- **Simplicity versus sophistication.**

  It is our experience that OPAC cannot be simple enough. On the other hand, bibliographical data are innately complex, while the possibilities for differentiation are virtually unlimited. Despite the pressure to exploit the potential for system enrichment we remain convinced that the simplest solutions tend to be best.

- Traditional versus progressive approach.

  There are many reasons for developing a system that retains visible links to traditional bibliographical practices. After all, users have worked with card catalogs, possibly with COM catalogs, for years and continue to do so. In many libraries the OPAC and more traditional search devices are offered side by side. On the other hand, OPAC offers the possibility of more progressive search modes (Boolean searches and other methods developed in the documentation field), which may well be more effective in the online environment than the immitation of tried procedures. The assumption is that, as OPACs become more and more accepted new conventions will emerge which are specifically adapted to a new technological environment.

- Internalised versus user-oriented.

  Related to the foregoing is the issue of user orientation. In principle, traditional practice gave high priority to internalized professional standards. Thus large catalogs have become complex instruments, built and maintained according to codes which inhibit access to information for many among the users who are not willing or able to master the required basic skills. Interactive search processes permit a lowering of the entrance requirements, so to speak. Thus, fore-knowledge of cataloging rules, filing codes, structure of subject coverage, typographical details, etc. can be made redundant through OPAC design. We believe that OPAC designers should opt resolutely for a user-friendly approach, diminishing the level of required information on the part of the client, whenever possible. This approach, we experienced, assumes a serious professional re-orientation, however, constituting a factor in the decision making process which should not be underestimated.

  We already discussed in some detail the issue of collective versus partial catalogs offered to the public, so let me skip this item here.

- Specialised versus generalised approach.

  The origin of this trade-off is the heterogeneity both of the patrons themselves and of the type of queries. Some queries start from quite specific information (verifying availability); other queries commence from the vaguest of notions, hoping to locate specific information in the process. Each of these information needs deserve their own dialogue, thereby making the system heavy and complex. We are faced therefore by a trade-off between specialized programs geared towards particular user orientations and generalized programs adequate for all users and search types.

In all these general and specifically OPAC design related trade-off areas, no simple answers, no easy solutions, are available. As already mentioned, the choices are determined by such issues as kind of library, collection size and type, the extent to which schooled staff is available to assist some or all users, not to mention the problem of available hardware and software configurations, political and economical realities, institutional and especially cross institutional commitments.

Ladies and gentlemen, I thank you for your attention, and will be happy to answer your questions.

References

1. JONES, L. The impact of technology on users of academy and research libraries: Paper presented at the IFLA conference, August 1983, München.

2. Council of Library Resources. Online catalogs: requirements, characteristics and costs. Report of a conference held at the Aspen Institute, Wye Planctation Queenstown, Maryland. December 1982.

3. SALMON, S.R. Characteristics of online public catalogs Library Resources and Technical Services, vol. 27 (1983) no. 1, pp. 36-67.

4. ALEWAETERS, G., NAMENWIRTH, S.M., SEGEBARTH, C. & VERPOORTEN, M. VUBIS: a user friendly online system. Information Technology and Libraries, vol. 1 (1982) no. 3, pp. 206-221.

COBBUL: A REAL ENVIRONMENT EXPERIENCE ON AUTOMATED VERSUS MANUAL CATALOGUE USAGE EDUCATION

Domenico Bogliolo

Department of Mathematics, University of Rome, Rome, Italy *

Abstract

The aim of our experiment was to compare the behaviour of two different classes of library catalogue users. The first user sample has been selected among typical library users of the University of Rome; the second sample has been selected in a skilled librarian environment in the same University.

Our results concern two separate steps: in the first step we collected data about the usage of a traditional non automated catalogue. Our aim was to identify look up difficulties, to measure research times and evaluate the retrieval performance. In the second step we collected the same data on our automated librarian system.

Results are compared and conclusions are presented about our methodology to optimize education to the use of automated librarian tools.

At the date of this IATUL Conference the experiment which I am going to describe has just come into its implementation phase.

At the present time, a group of librarians at Rome University, together with a small sample of library users, is working intensively on the trial. Intensively because of the nearness of the summer holidays, I suppose ...

What I want to say is that I came here while our experiment has not yet come to its conclusion. Nevertheless, we believe that it would be very important for us, and, we hope, for you too, to give you some idea of what we are doing in Rome and describe our purpose.

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* working team:
P. Biancofiore, D. Bogliolo, G. Corvino, L. D'Antone, R. Janera, M. Palozzi, A.M. Tammaro, L. Vespucci

There are two main reasons for such a choice:

i) because of the first steps in library automation now taking place in the Italian universities, and comparison with what has been done in other universities throughout the world;

ii) because of the belief that is better to give full account of the methodology rather than showing outcomes that hardly can be meaningful outside their strict context.

The "COBBUL" project

I cannot talk about our experiment without some appraisal on the context in which we carried it out.

Since 1983, a working group of many librarians at the University of Rome have outlined and developed a project on Bibliographical Cooperation among Latium University Libraries - that is COBBUL - with tools and assistance provided by the Interfaculty Computer Centre.

There were two main objects:

i) in order to realize a cooperation and sharing of bibliographical rescurces among the existing 189 Institute or Department or Faculty libraries of the four Latium universities: the old - called "the first" - University of Rome "La Sapienza", the new -also called "the second" - University of Rome "Tor Vergata", the Viterbo University "Della Tuscia" and the Cassino University, in collaboration with the university central library "Alessandrina";

ii) in order to increase information and access to the bibliographical resources of the university libraries, through the creation of one new acquisitions' union online catalogue - at least 20,000 new items a year.

Currently, the online catalogue of monographs' and the card catalogue, both producted by computer, are maintained as parallel files. Retrospective conversion of catalogue records prior to 1983 into machine readable form, will begin in 1985. The librarian's working team who outlined the Project is now involved in its development.

They are preparing a union list of current serials - about 12,000 journals - with the technical aid of the National Research Council's Institute for Scientific Documentation. Moreover, they have set up a service of selective dissemination of information with diffusion of a classified bulletin and other printed outputs according to patron's profiles of interest.

Monographs records in the online catalogue are accessible through the UNIDAS information retrieval system, both by keys such as author, title, subject, series, uniform title, keywords which can be combined by the usual Boolean algebra operations. In the future, all machine readable records, regardless of date or type of material as monographs or series, will be incorporated into the online catalogue.

The development of a user oriented system

It is known that any system designed for effective use by experts is not suitable for use by non-experts.

Since the class of non-expert, infrequent or new users still remains a rather large, heterogeneous population, our efforts are oriented towards improving interfaces to the system with more than one class of "end users". It is, therefore, important for us to realize the causes which affect the common interface problems and obstacles to effective search interactions.

At this early period, our system has been designed for the occasional user who has previously only had experience of a manual card catalogue. Such a user could develop his search capabilities, as he can learn from the current use: that is the reason why the class of the instructions we supply to our users are essentially applicative.

Purposes of the experiment

These facts were the starting point of our experiment regarding the different behaviour of the different classes of users facing two different search strategies: the ones involved in the use of a conventional card catalogue and in the use of an online catalogue.

The research can also be finalized to include at least five objectives:

1) the measurement of the effectiveness of the instructions provided to the users, in order to optimize the results of the bibliographical searches carried out on the two catalogues;
2) the estimation of the differences between the results of the bibliographical searches carried out either by a non-expert user or by an expert;
3) the comparison between a search carried out using a proper method and a search with an improper method;
4) the achievement of outlines related to the search strategies adopted by different classes of users;
5) to get some information about the effectiveness of the catalogues used in the experiment.

Methodology

In the testing phase, the experiment was carried out on a limited number of users, randomly selected among undergraduates of the first and last years of a university degree course, and a set of librarians as a control group. As can be seen in the attached flow diagram (see figure 1), the users were divided in different groups, an A group and a B group.

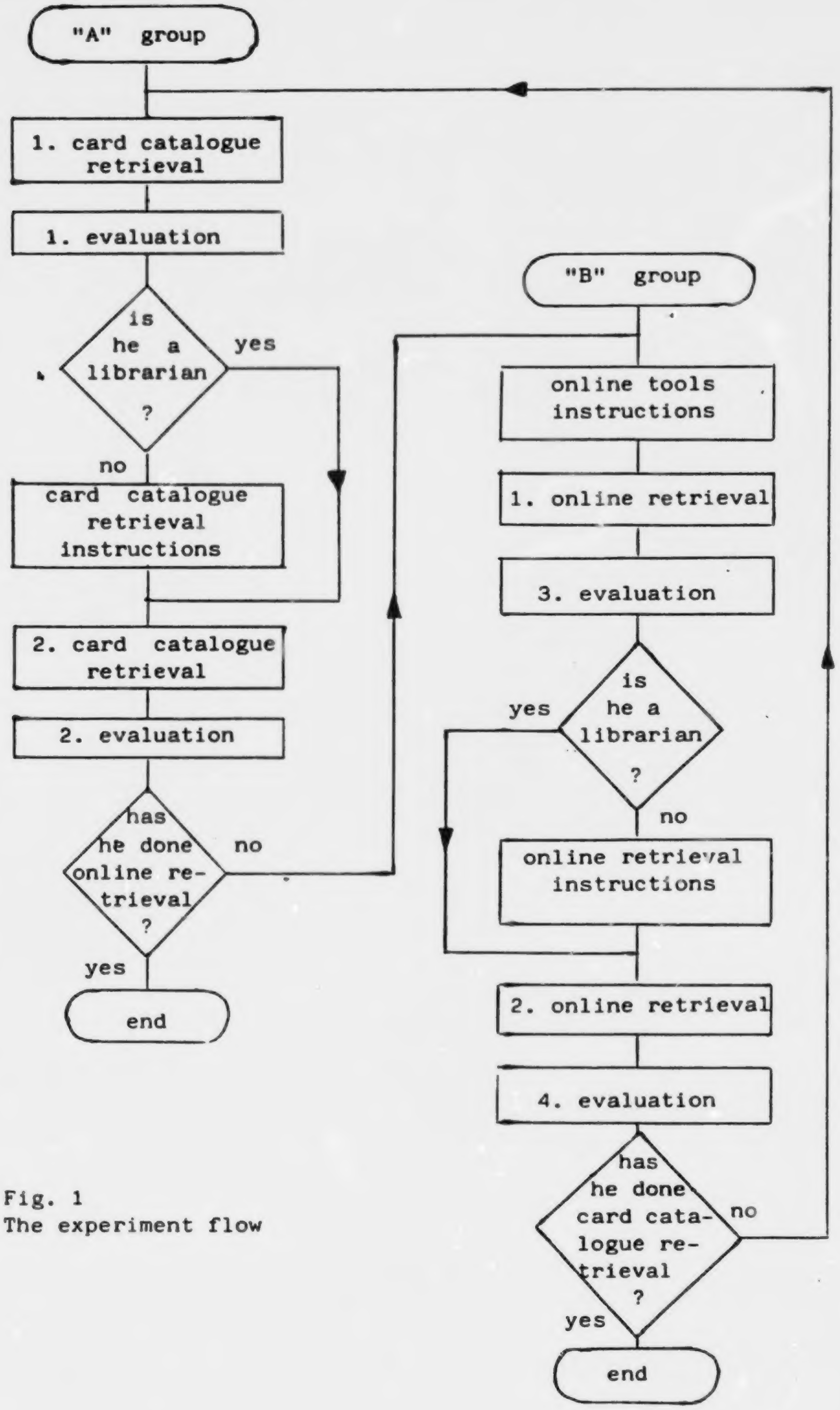
"A" group
1. card catalogue retrieval
1. evaluation
is he a librarian ?
yes
no
card catalogue retrieval instructions
2. card catalogue retrieval
2. evaluation
has he done online retrieval ?
no
yes
end
"B" group
online tools instructions
1. online retrieval
3. evaluation
is he a librarian ?
yes
no
online retrieval instructions
2. online retrieval
4. evaluation
has he done card catalogue retrieval ?
no
yes
end

Fig. 1
The experiment flow

The A group has to carry out a search in the card, so called conventional catalogue, at first without any education in the proper method of retrieval. The outcomes of these searches are then evaluated. The next step consists of providing the group with a set of bibliographical instructions directed towards the optimization of the result of the searches. A second search in the card catalogue is subsequently carried out, with a second evaluation of the findings.

At the next step, the A group meets the online catalogue, provided only with essential information about the handling of a terminal keyboard as well as information retrieval rules and procedures. In the same way as in the former steps, the outcomes of the searches are evaluated. Then the A group is provided by a set of bibliographical instructions related to the recognition of the different ISBD areas into which the records are divided, and a final search with its final evaluation is carried out.

The B group, on the other hand, will start its retrieval operations in the online catalogue. The users of the B group work through the same programme as the A group, and come at last to the card catalogue retrieval phase. Essentially, either the A group or the B group do the same things with the two catalogues, but they do them in an inverted succession.

The reason for this choice lies mainly in the care in avoiding, as far as possible, the probability of learning the proper retrieval method from the searches previously done. It is in fact very important that the behaviour of the user is as near as possible to his/her usual behaviour. It is only in this way that we can measure the result of the instructions provided by the users, together with the real capabilities for carrying out effective retrievals.

The librarians control group has to carry out a twofold task:

i) to obtain a unit of measurement as objective as possible, about the real capabilities of the card catalogue for the supplying of bibliographical information, if properly consulted;

ii) to establish a common term to which it will be possible to refer the values of the outcomes of the searches carried out by the two user groups.

On the contrary, it is obvious that the retrieval capabilities of the control group do not differ very much from those of the two user groups, when all are involved in the online retrieval. Maybe we shall rather come up against some pleasant surprises.

Measurements

The experiment will try to measure the following variables in order to establish the real effectiveness of the catalogues and the related access strategies:

1) recall ratio, as the proportion of retrieved documents to the documents held in the two databases. It has to relate to silence ratio, or the number of documents non retrieved in proportion to the number of the documents held in the two databases;
2) time spent per capita in each search;
3) number of the key entries used per capita in each search;
4) number of the searches done per capita for the same entry;
5) type of the key entries used per capita;
6) type of the searches done per capita for the same entry.

Since the user groups, as well as the control group, will carry out their searches on a definite and pre-arranged range of items, the relevance of the findings will be equal to their pertinence. In other words, we have to consider that the user's information needs will coincide with the user's information demands. In the same way, the above mentioned recall ratio will be considered equal to the precision ratio, or the ratio of the number of retrieved documents considered relevant to the total number of documents retrieved.

It is in fact necessary to establish in advance a perfect correspondance between the information available from the card as well from the online catalogue.

Conclusion

As I said at the beginning of the paper, I cannot give any outcomes from our experiment, because the experiment itself has not yet reached its conclusion. This means that the methodology which I related has not been tested. Testing the methodology is precisely what the librarians working team is doing in Rome at this moment, with the collaboration provided by the sample of users.

We all believe that if the test will be successful, the next step would be the implementation of a research on a large sample of users, as well as on all the card catalogues of the university libraries of Rome.

Attached to this paper, you can find the forms we set-up for our test. Moreover, a bibliography is given, drawn out from the more recent literature issued on the topic.

COBBUL PROJECT

MANUAL VERSUS ONLINE RETRIEVAL
A STUDY ON THE BEHAVIOUR OF TWO SAMPLES OF USERS

FORM A

USER IDENTIFICATION

Name ______________________________

Password ______________

Group: I ☐ IV ☐ Librarian ☐

Has he done the online search? yes no

Kind of search: easy ☐ middling ☐ difficult ☐

Did he receive instructions? yes no

COBBUL PROJECT

MANUAL VERSUS ONLINE RETRIEVAL
A STUDY ON THE BEHAVIOUR OF TWO SAMPLES OF USERS

FORM B

OUTCOMES OF THE SEARCH number ______ password ________

Entry looked up ______________________________

____

Search phase / search time

1) ______________________________

______________ time spent ________

2) ______________________________

______________ time spent ________

3) ______________________________

______________ time spent ________

4) ______________________________

______________ time spent ________

5) ______________________________

______________ time spent ________

TOTAL TIME ________

☐ Find

☐ Not find

Bibliographies

DICKSON, J. An Analysis of user errors in searching an online catalog. Cataloging & Classification Quarterly, vol. 4 (1984) no.3, pp. 19-38.

ESTABROOK, L. The human dimension of the catalog: concepts and constraints in information seeking. Library Resources & Technical Services, vol. 27 (1983) no. 1, pp. 68-76.

EGELAND, J. The importance of user education and training in a multi-data base online information network. In: Zunde, P. ed. Information utilities. Proceedings of the 37th ASIS Annual Meeting. Atlanta, Georgia, October 13-17, 1974. Vol. 11, pp. 137-140.

FIDEL, R. & SOERGEL, D. Factors affecting online bibliographic retrieval: A conceptual framework for research. Journal of the American Society for Information Science, vol. 34 (1983) no. 3, pp. 163-180.

FORD, J. Research in user behaviour in university libraries. Journal of Documentation, vol. 29 (1973) no. 1, pp. 85-106.

FREEDMAN, M.J. Must we limit the catalog? Library Journal, vol. 109 (1984) no. 3, pp. 322-324.

HANSEN FENICHEL, C. Online searching: measures that discriminate among users with different types of experiences. Journal of the American Society for Information Science, vol. 32 (1981) no. 1, pp. 23-32.

HARDY, A.P. The selection of channels when seeking information: Cost/Benefit vs Least-Effort. Information Processing & Management, vol. 18 (1982) no. 6, pp. 289-293.

HORNY, K.L. Online catalogs: Coping with the choices. The Journal of Academic Librarianship, vol. 8 (1982) no. 1, pp. 14-19.

INGWERSEN, P. Search procedures in the library - Analysed from the cognitive point of view. Journal of Documentation, vol. 18 (1982) no. 3, pp. 165-191.

KOCHEN, M., REICH, V. & COHEN, L. Influence on online bibliographic service on student behavior. Journal of the American Society for Information Science, vol. 32 (1981) no. 6, pp.412-420.

MALTBY, A. Measuring catalogue utility. Journal of Librarianship, vol. 3 (1971) no. 3, pp. 180-189.

MOGHDAM, D. User training for on-line information retrieval systems. Journal of the American Society for Information Science, vol. 26 (1975) pp. 184-188.

NEVILLE, H.H. Computers and the language of bibliographic descriptions. Information Processing & Management, vol. 17 (1981) no. 3, pp.137-148.

PEARSONS, P. & TIEFEL, V. Evaluating undergraduate library instructions at the Ohio State University. The Journal of Academic Librarianship, vol. 7 (1982) no. 6, pp. 351-357.

RAMSING, K.D. & WISH, J.R. What do library users want? A conjoint measurement technique may yeld the answer. Information Processing & Management, vol. 18 (1982) no. 5, pp. 237-242.

RICHARDS, T.F. The online catalog: Issues in planning and development. *The Journal of Academic Librarianship*, vol. 10 (1984) no. 1, pp. 4-9.

ROUSE, W.B., ROUSE, S.H. & MOREHEAD, D.R. Human information seeking: online searching of bibliographic citation networks. *Information Processing & Management*, vol. 18 (1982) no. 3, pp. 141-149.

TOLIVER, D. A program for machine-mediated searching. *Information Processing & Management*, vol. 17 (1981) no. 2-B, pp. 60-67.

WALTHER, G.H. & O'NEIL, H.F.Jr. The user-computer interface in an information utility delivery system: an empirical approach to user-centered design. In: Zunde, P. ed. *Information utilities. Proceedings of the 37th ASIS Annual Meeting. Atlanta, Georgia, October 13-17, 1974*. Vol. 11.

WEISS MOORE, C. User reactions to online catalogs: An exploratory study. *College and Research libraries*, vol. 42 (1981) no. 4, pp. 295-302.

WILDE, D.U. Documenting user benefits in an information analysis center. In: *Information Revolution. Proceedings of the 38th ASIS Annual Meeting. Boston, Massachusetts, October 26-30, 1975*. Vol. 12.

PENNIMAN, W.D. A stochastic process analysis of on-line user behavior. In: *Information Revolution. Proceedings of the 38th ASIS Annual Meeting. Boston, Massachusetts, October 26-30, 1975*. Vol. 12.

STANDERA, O. On-line retrieval systems: Some observations on the user/system interface. In: *Information Revolution. Proceedings of the 38th ASIS Meeting. Boston, Massachusetts, October 26-30, 1975*. Vol. 12.

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LIBRARY AUTOMATION: A REVIEW OF INTEGRATED TURN-KEY SYSTEMS

Johan van Halm

Information Associates, Amersfoort, The Netherlands

Abstract

After a brief description of library automation trends, the various stages in the development and implementation of automated library systems and the impetus for automation, I shall concentrate on the various functions which vendors offer to automate and the "extras" offered, as well as criteria for vendor selection. I conclude with a brief review of the various integrated systems for library automation and a comparison of the basic functions offered by each system (a matrix of functions and systems is provided).

Introduction

This presentation has been tailored to an audience of academic librarians, but most of the information applies to other types of libraries, with some minor exceptions.

The library automation that has taken place so far, has not radically transformed library services, but has enabled libraries to do basically what they always did, but more efficiently and less labor-intensively than before. At present "technical" functions and services have been automated rather than user-oriented services with the exception of public online catalogues and public access circulation systems. What other trends are noteable?

Library automation trends

The following trends have been identified:

- a shift from stand-alone systems to a single integrated system by which is meant the linking to a central library database, while operating as a local stand-alone system (a way to keep autonomy for a library)
- integrated multifunctionality
- the proliferation of microcomputers and microcomputer software
- the sharing of facilities and functions
- the interconnection of library networks with distributed functions
- single integrated automated systems with gateways
- open-ended (compatible) systems
- a decreasing importance in the size of the collections and increased access to shared resources
- the automation of user services
- the replacement of first generation circulation systems

Impetus

Initial impetus for library automation may come from a variety of sources and directions:

- colleagues
- advertisements in professional journals
- sales representatives
- exhibits at conferences
- demonstrations
- own organisation
  - budgetary reasons
  - increased professionalism and management
  - a wish or need for better services
- desires for networking

Studying a variety of (commercially) available systems and looking at the various functions these systems will cover - based on information from a variety of sources like meetings with vendors, demonstrations, brochures, experiences of librarians, etc. - we have come to five options for library automation systems.

Systems selection

When you are shopping for a system you have at least five options:

1. Turnkey systems
2. Systems developed by a library which may be transferred to your library (in-house transfers)
3. A library microcomputer
4. Joining a library network
5. Developing your own mainframe or minicomputer based in-house system.

In my opinion it is beyond the reach in terms of expertise, capabilities and resources of most (academic) libraries to develope their own particular automated library system or to install a so-called transfer system. Most networks do not meet your requirements on the long range (their "development priorities" are never yours). The option of buying a cheap(er) microcomputer provides you with a soft-ware problem not easily solved and a capacity problem. However, the options needed by a library depend on the institutions's purposes, its range of clients, the nature of the present, and foreseen, services and other factors specific to the institution and the needs can be described in a "needs analysis programme".

In most automated systems a number of successive stages in the development and implementation of the automated library systems can be distinguished (2):

1. the decision to automate - the feasibility study

2. determination of requirements (need analysis)
3. systems analysis and design of alternatives
4. evaluation and selection
5. implementation
6. training and organizational change
7. continuing review and evaluation, and
8. maintenance & new releases (contract)

Of this long, complex and time consuming process, which might result finally in a - hopefully operational - automated library system, we will only touch some aspects of the systems and vendor selection. Furthermore we concentrate on turnkey-integrated systems as they release the librarian from the bulk of the system development process. The library need not spend time, money or effort in building its own system as there are a number of turnkey vendors that have assumed the risk of developing systems for libraries. They generally are able to provide a much more sophisticated system to an individual library then the library could develop on its own, and at a far more reasonable price. Turnkey vendors are able to do this by amortizing the system development costs over a number of systems. A turnkey system brings automation to the library as a purchasable end product (2). We might define a turnkey system as "a comprehensive package combining all the necessary hardware, system software and applications software, which can be, in effect, plugged in and set running" (4). So, when you buy a turnkey system a vendor will supply you - in accordance with your specifications - a complete package consisting of:

- hardware
- software
- installation & implementation
- training
- maintenance
- new releases

all in one hand.

Functions offered and vendor qualifications

With most of the vendors of turnkey integrated systems offering more or less good the same in terms of basic automated functions it is the extras offered by the vendor that count (see table I).

So, you have to look at differences in

- hardware
- extras
- technology
- understanding and professionalism
- customer orientation.

TABLE I FUNCTIONS AND CAPABILITIES OF INTEGRATED LIBRARY AUTOMATION SYSTEMS - A SELECTION

	ACCOUNTING (not integrated)	ACQUISITION	ARCHIVES INVENTORY & CONTROL	BUDGET CONTROL	CATALOGING	CIRCULATION	COMMUNITY INFORMATION SERVICES	INDEXING	INTEGRATION	INTERCONNECTION/GATEWAY	MANAGEMENT/MIS	MODULAR	ONLINE SEARCHING EXT. DBS	PRINT GENERATOR	PUBLIC ONLINE CATALOG	SEARCHING	SERIALS CONTROL & HANDLING	STATISTICS	THESAURUS	VIDEOTEXT	WORD PROCESSING (not integrated)	MULTILINGUALITY	
ADLIB	x	x	x	x	x	x		x			x	x	x	x		x	x	x	x		x		**PRIME**
ALS					x	x		x	x		x				x		x	x	x				**GOULD/SEL**
BASIS		x	x		x	x		x	x		x	x	x	x	x	x	x	x	x		(x)		**various MF**
BRSearch	x		x		x				x		x		x	x	x	x							**IBM**
CLSI	x	x	x	x	x	x		x			x	x		x	x	x		x					**DEC**
DOBIS/LIBIS	x	x	x	x	x	x		x	x			x	x	x	x	x	x	x	x			x	**IBM**
EASY DATA	x	x	x	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	(x)		**DATAPOINT**
GEAC	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	(x)	x	x	x	x	x	**GEAC**
MICRODATA		x		x	x	x		x	x		x	x		x	x	x	x	x					**MICRODATA**
MINISIS			x	x	x	x			x	x					x		x			x			**HP 3000**
OCLC/LOCAL/2000		(x)		(x)	x	x		x		x	(x)		x		x		x			x			**HP 3000**
SIBIL		x		x	x	x		x				x			x	(x)		x					**IBM**

A customer-oriented vendor offers you

- high tough versus high technology

fulfils your needs for

- solutions (problem solving)
- convenience (comfort)
- economic value

and knows your organisation, but most of all a vendor should extend your horizon through

- integration
- networking, including gateway facilities
- new releases

Quality measures of the vendor are, amongst other things,

- Reputation
- Length in business
- Knowledge of the field
- Financial stability
- Other products
- Users of this product
- Response to this product
- Support services
- Geographic location
- Accessibility by phone
- Frequency of package enhancement
- Customer orientation

Integration

Integration* means more, than an integrated system which caters for cataloguing, circulation, acquisitions, serials control, public access online catalog functions, reference assistance, common data base maintenance, bibliographical control and authority file, and library management. Those typical functions should be integrated with office automation functions (word processing, electronic mail and records management), access to external data bases (online, videotext, main frame applications) and in general be able to extend your needs.

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* By integration is meant:
the ability to ensure that data items need not be duplicated when additional applications call for their use, which will allow to update an item and have the change recognized throughout the system.

My message!

When you are shopping for an automated library system, you have an opportunity now to select an appropriate combination of hardware, software and datacommunications. The right combination might give you more than just an integrated library automation system, and might include such features as

- access to internal databases on the parent organisation's main frame computer(s)
- access to external online and videotext data bases
- EDP instruments including word processing, calculations, electronic mail, etc.
- electronic document delivery, including ILL
- interconnection with (other) library networks

Literature

1. CIBBARELLI, P. et al. Directory of Information Management Software 1983 - for libraries, information centers and records centers. Cibbarelli & Ass., 1983. 133p.

2. MATTHEWS, J.R. Choosing an automated library system. A Planning Guide. Chicago, ALA, 1980. 119 pp.

3. RUSH, J. Library Systems Evaluation Guides
   Vol. 1: Serials Control
   Vol. 2: Circulation Control
   Vol. 3: Public Service
   Vol. 4: Acquisitions
   Vol. 5: Management Services
   Vol. 6: Interlibrary Loan
   Vol. 7: Cataloguing
   Vol. 8: System Integration
   Powell, Ohio, JERA, 1983.

4. KEREN, C. ed. UNESCO, General Information Programme (GIP) /UNISIST, International Inventory of Software Packages in the Information Field. Paris, UNESCO, 1983. (PGI-83/WS/28)

TRAINING FOR ONLINE INFORMATION

Automation, Libraries, Users and the Future

Arja-Riitta Haarala

Tampere University of Technology Library, Tampere, Finland

Abstract

Tampere University of Technology Library has for some years carried out online searching from external databases, and in 1983 online catalogues were introduced at the library. User education is a part of the university curriculum. A compulsory library introduction for first-year students includes information about online methods applied in libraries. An information devices course provides a more profound understanding about online methods. A seminar for doctoral students is planned to include online techniques and how to use online methods in their information handling.

Other means of user education and marketing of library and information services are reported in the paper.

User education is followed by a number of surveys: a catalogue study, the use of the library by academic staff and a user education survey. The results of these studies, with respect to online information, are reported.

The increasing availability of large computerized databases has, for several years, served as an indicator to libraries that a greater change in running libraries and providing information services to users is bound to happen. Libraries are now less comprehensive than they were, and databases provide a better indication of what exists than a library catalogue. The tremendous increase in scientific and technical literature in the 1950s and 1960s caused an information explosion. Therefore the problem of today is information overload. New methods are needed to filter information to users in order to disseminate the right piece of information to the right person at the right time.

This paper arises from the automation milieu that can be found in science and technology libraries. Therefore I shall first briefly review some automation applications in libraries to describe the milieu, and then go on to the matters I find important in connection with the training for online information.

The Automated Library Environment

Computers have extended their influence into all sectors of library and information work. For nearly three decades, computers have been applied to the production of abstracting and indexing journals to ease the information problems and, especially, to provide faster access to information. All this has become most important in those multidisciplinary fields of science and technology, where an individual user or library may no longer be able to keep up with the ever growing and often uncontrolled literature.

Locally in libraries, computers were used to produce abstracting and indexing bulletins and in-house lists of library material. In the 1960s and early 1970s the realm of KWIC-, KWOC- and other computer-printed indexes was overtaken by automated information retrieval. One of the most productive innovations was computer-based selective dissemination of information which achieved considerable popularity among the users of scientific and technical information. But even more convenient systems were developed, and along with the development of telecommunications networks, online searching facilities were introduced worldwide.

Since the 1950s much progress has been made in library housekeeping. As a result of computerization, greater standardization and cooperation, library automation has passed through its experimental phase into the operational phase, and is taking its first steps in the direction of integration and networking. Information technology provides a wide range of new services from on-demand publishing to facsimile transmission of documents. Such services have already been tested for some time, and they will bring a welcome addition to present library and information services.

Tampere University of Technology Library has carried out online searching from external databases for nearly a decade. The online cataloguing system SESAM was introduced in the spring of 1983, and online catalogues were open for users.

The need for such new systems has been real, otherwise we would not have witnessed such a rapid growth in the use of these new products and services. According to surveys conducted by the Finnish Council for Scientific and Technical Information and Research Libraries (TINFO), for instance, online searching grew at nearly 50 % annually in the 1970s and more than that in the 1980s, but the growth virtually is partly due to the local online systems introduced recently.[1, 2] It is increasingly difficult to forecast or even to count the present number of online searches performed. A major step towards online methods has been taken: online catalogues have taken the place of card catalogues and the number of online searches has thus multiplied. This will be the final shift towards the automated handling of information in libraries and users are bound to face it whether they like it or not. And furthermore they must learn how to make the most use of it.

Users of Science and Technology Libraries

If libraries are to have the future role in providing computer-based services, as well as providing users physical access to documents, they should be innovative and become media centres rather than book repositories. However, there will be many types of users with various needs to serve. The reality is that most potential users are still non-users and they may never become users at all. Several reasons can be proposed: database inadequacy barrier, apathy barrier, access barrier, financial barrier, and ignorance barrier.[3] One of the unsolved questions is whether users will take over online searching, or whether it will largely remain an information worker's domain.

I will now refer to some user categories found at Tampere University of Technology Library, each of them having some identifiable characteristics, information needs and habits.[4]

First year students in the University are fresh and their main need is to find textbooks in the Library. Therefore the main concern is how to use the library, its facilities and services. Nowadays many are very knowledgeable about microcomputing and therefore they are eager to test all possible computer systems. This enthusiasm should not be wasted but lead in the right direction, the extended use of the library. In our case first year students get a two-hour compulsory introduction to the library during the first week of studies. No special emphasis to online is given but it is included as a modern and useful library technique. Anyway our Sesam catalogues are very easy to use so that almost no training is needed.

Students in the second or third years have more specific needs: they must find out material for their studies. Being a technology student, the biggest problem is not terminals and other equipment but rather how to find a book on the shelf. According to our surveys, students find, for instance, online catalogues very easy to use and they prefer online catalogues to microfiche catalogues which is not always the case with librarians. Similarly to first year students they find everything with machines and equipment easy and interesting. For instance, our videotex terminal is in frequent use although there is not much usable information available for them. Online methods are included in an information devices course to provide a more profound understanding. A credit-giving course is organized every term and one third of students take it as an alternative. Our own Sesam system is taught thoroughly but only demonstrations of international systems are given. The system features, such as commands are included, and also the structure of databases and the ideology of searching are dealt with. We also include special catalogue training events for students during the next term.

Postgraduate and doctoral students need information and literature for their reports and theses. They have often a positive attitude to libraries and information services because they are frequent library users and also frequent information service users. However, cumbersome manual searching is ignored and online searches are carried out instead. A seminar for doctoral students next term is a part of our new project and it is planned to

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include online techniques and how to use online methods in their online information handling. A special emphasis is given to microcomputing and the input of information.

Teachers and other university staff are often busy with their daily tasks and duties. They seldom want to find out how systems work but rather rely on others, e.g. librarians and information workers, for this matter. Without doubt, they are often in awe of new systems, conservative, and not willing in many cases to become a student again to learn the system. It would appear that their dignity may suffer if they are seen to be inexpert. First Monday of a month is a special library introduction for this user category and some have made use of it.

External users have varied information needs and habits. They also have a varied attitude to automation. At our library, the real online catalogue users are from the neighbouring town looking for information about micros or motor vehicles. But another sort of user is a busy businessman who wanted the answer before he asked the question. Such users often have a better motivation towards learning how to use an online catalogue than university staff, but they are often shy to ask or bewildered at the explanations. We have developed very general courses for them and more specific ones are under planning.

This is by no means a full account of users, but rather an attempt to stereotype some users. It is hardly possible to define exactly user needs and habits. Anyway, the slower growth of library collections compared with that of information production makes the libraries probably unable to satisfy the various needs of the user community.

Techniques of User Education and Marketing of Library and Information Services

Information systems have become versatile and complex during the years of automation. It is not self-evident how to use the system. Users must obtain the skills of how to master these new products and services. They must acquire reading and writing ability for the new media: what one might call 'new system literacy'.

There are many teaching and learning methods: in most cases a combination of many methods is needed. User education includes a great deal of marketing and use promotion, because the objective of all these activities is the efficient and extended use of library collections and other information resources, and to instruct users accordingly in the use of relevant information.

Today, users struggle with a diversity of sytems. The problems of man-machine communication are brought to light by interactive systems. I shall not go into the question deeply because thick reports can be found in libraries; instead I shall touch on the question of organizational influence in this context.

Organizational Influence

I want to conclude my paper at this seminar by saying that automation is a challenge for libraries and information services designing new systems and improving old ones. A contribution made in information technology and in training for information may be highly productive if successful. Brian Vickery made an interesting analysis of the factors that affect end-user access of online systems. He sums up 'the contribution of factors is complex, and assessment of their relative importance is difficult'.[5]

Not only training is important but also cost aspects have become most important. Libraries have traditionally offered their services free of charge. New services based on expensive technology make it economically difficult for libraries to serve users with limited and shrinking resources. How can charging be justified? This topic of cost recovery is being debated throughout the world. There are several factors that cause expenses in online searching: direct costs; staff costs; terminals; manuals; training etc. In Finland in 1982/1983 direct costs for one online search from abroad were about 250 Finnish marks (US$ 40) on average. If, for instance, Tampere University of Technology Library has offered one online search free of charge for staff and students it would cost over half the literature grant of 1.25 million Finnish marks (US$ 0.21). It is absolutely impossible to finance that. On the other hand, if the number of searches undertaken worldwide increased a hundred fold, it is probable that search costs would decrease by the factor of ten, in addition, database quality and service aspects would improve. It is likely that there will be an evolution towards lower-cost online retrieval, with online delivery of documents or partial text. Other approaches have to be developed. In our case, institutes use general purpose and other available funds for online searches. Last year the number of online searches carried out from international databases tripled.

The talk of elitism in connection with information systems is not quite fictitious. They are even sometimes called elite systems. My opinion is that there is a group of fortunate users who know how to manage these systems and utilise the new media. Systems of today are not difficult to master, but it is far too cumbersome to remember all system features like commas, slashes, abbreviations etc. User-friendly systems are still to come. Systems must be changed and not the users, if a larger audience is going to be reached. It cannot be taught only by means of user education. It is a librarian's responsibility to take account of these aspects by being in a position to choose computer systems for the library. Our users in science and technology libraries can use systems easily, but they very likely do not use systems differently to those with which they are familiar.

References

1. MYLLYS, T. Study of online usage in Finland. Signum, vol. 14 (1981) no. 10, pp. 198-203.

2. REPO, A.J. Use of online information systems in Finland. Signum, vol. 17 (1984) no. 2, pp. 33-41.

3. LEA, G. Database non-users: Has their future arrived too soon? (European User Series: 4) 1977, pp. 65-74.

4. Unpublished user surveys carried out at Tampere University of Technology Library.

5. VICKERY, B. The impact of new technology on libraries and their users. IATUL Proceedings, vol. 14 (1982) pp. 1-10.

THE USER INFLUENCES (SHAPES) LIBRARY AUTOMATION

Kurt Schröder

Central Library of the Nuclear Research Centre,
Jülich, Federal Republic of Germany

Abstract

Intending to find a solution of this "Inverse Problem" in the literature and information providing division of a large Research Center the components of the system - Patron - Library - EDP - are represented first. Represented in their historical, natural, economical political ...... levels and observed in a competitive interplay. This interaction brings about the evolution of a dynamic library using all advantages of its formerly static past, i.e. all its evolutionary outfashioned stages. The present stage reveals, that such a library is controllable only by respecting and performing the initial and boundary conditions budget and work. This work presupposes, however, for its fulfillment, enthusiastic staff, cooperative patrons and an almost-perfect EDP accompanying the daily run of library business, which allows presentation of information, at any time or places about the physical state of the data. The technical conditions are satisfied if there are the appropriate peripherals and programs as well as, most important, the databases. These databases must be of a service conditioned diversification reaching far into the subtle description of bibliographic data and even beyond.

Maybe our conference theme 'LIBRARY USER EDUCATION IN THE ONLINE-AGE' stressed its visionary component for me so that I sat down to write the present abstract of an as yet non-existent paper. Meanwhile, the provocative intention to state and solve the 'Inverse Problem' has given way to modesty. As a basis for user education, I have made an attempt to optimise reality and after that perhaps to create some educational matter. Whether library automation can be influenced by users has to be decided by everyone in their own surroundings. For us this is the environment, into which we and our library - the Central Library of the Nuclear Reseach Centre Jülich - are embedded, for which we exist and by which we live professionally.

The "Kernforschungsanlage Jülich GmbH." is one of 13 national research centres in the Federal Republic of Germany. It has about 4550 employees, 880 of them being scientists. Its objectives are to broaden scientific knowledge and to develop technologies that can serve as means for the social and economic well-being of man and a healthy environment. Basic research and energy technology are given an almost equal weight in the work of the KFA.

The KFA's program of basic research on multiparticle systems covers the following fields:

- Physics and chemistry of solids (including materials development), surfaces, liquids, and dense gases,
- Reaction chemistry, particularly catalysis

- Molecular biology and biotechnology,
- Physiology (including medical sciences).

The energy research focuses on:

- Development of high temperature reactors and high-temperature materials, particularly for the supply of process heat,
- Petroleum exploration,
- Chemistry of the pollution in the atmosphere and the ecosphere,
- Decomposition and purification of fossil fuels,
- Analysis of complex energy systems.

To this can be added the expectations of the staff of the associated firms and the external independent problems:

the booksellers, publishers, clearing houses, exchange partners, interlibrary loan participants, sources of information - the hosts - etc.

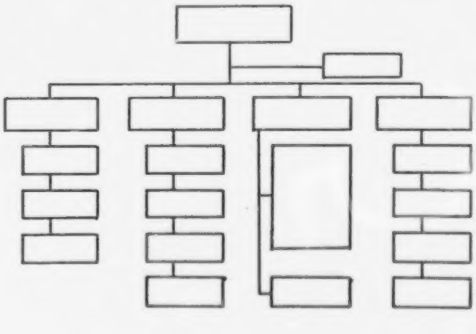
11 Mit den Wölfen mußt du heulen

Fig. 1 To howl with the pack

And the internally coupled problems:

Acquisition, Reference, Availability

In times of surplus personnel and money, or, to be more precise, during the initial phase of its existence, some 20-25 years ago, and influenced by similar libraries, our library was organised hierarchically:



This organization accessioned 10-20,000 monographs, dissertations, reports, about 3,000 current periodicals - annually -

processed, in a luxury manner, initially by punched tape, later via MDS DATA RECORDERs and currently by means of a NIXDORF 8870/8 on magnetic disks, about 150,000 bibliographical and synoptical data sets, each numbering about 1,000 characters,
lent more than 100,000 items per year
completed manually 120-150 literature searches equalling 3-4 man years
edited its own report series and
performed many other bibliotecarical pecularities.

To manage all this on a budget growing from 1 to 2 million DM and personnel shrinking from 85 to 50 made us not only think, but also act.

Now let us summarise what generations before us have already expressed and what is called the user's expectations of his library:

expert understanding of his query
acceptance of queries in whatever form
external/internal reference facility
provisional acquisition policy
quick and convenient delivery of literature.

Who then is this user for whom all this trouble is justified?

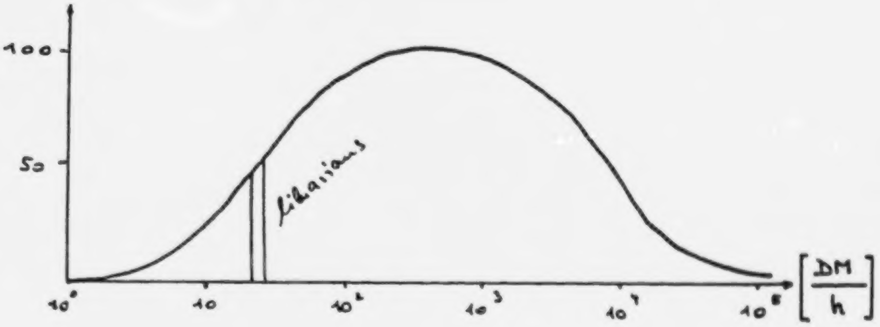


Fig. 2 Overhead costs

Fig. 2 shows us the distribution of the overhead costs of our most active users. Most of them are in the expensive sector and only a few are below the level of librarians, just as there are some who work for heavenly reward. So the people we are serving are one, two or even three orders of magnitude more expensive than ourselves. The same is true for the guest scientists from all over the world who work with us. Their temporary stays and their wish for utmost productivity during that time leave no space for extramural learning. The German law about shopping hours and social commitments in itself requires considerable adaptation. In addition there is the heightened expectation of our own scientists who regularly spend some time in foreign institutes and have come to know the user comfort offered there. Optimistic memories act as driving force for the library service.

What does this type of user statistically offer, apart from his/her expectations?

- One publication annually, together with 2-3 co-authors and 25 citations
- one paper read at a conference per year
- once a week, a visit to the reading room of the library
- one xerox copy order per week
- less than one expanded literature search per year
- (unfortunately) unknown use of one of the 40 odd branch libraries which hold roughly 20 % of the total stock
- and a very interesting count of citations as regards their age from the classical time of our library eleven years ago.

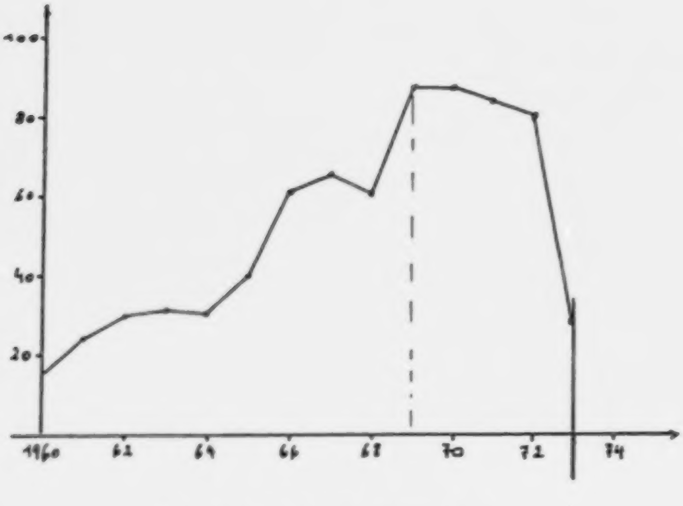


Fig. 3 Age distribution 1973

In Fig. 3 we see the number of citations distributed over their publication year.
We counted the citations in roughly 100 Solid State Physics publications.
The peak is between 2-3 years ago.
We dared to conclude that our colleagues

- apply themselves to aged, non-productive problems
- are not informed about the newest literature in their appropriate fields
- do not think it worthwhile to cite the newest known literature

or other equally infamous explanations.

If the age of the maximum distribution is not a universal constant, it should be possible to diminish it when the information source, i.e. the library, makes its contribution and thereby gets out of the red. To achieve this the usual path, tramping to the author and subject catalogs or to the information desk, has to be left. But how?

Evidently, the whole work organisation of the library should be analysed in order to optimise it. It is really very simple.

One scrutinises the permeable points in the library, e.g. postal service, telephone calls, lending counter, information desk;
give name to the emergent objects, data, facts, ...;
follow them from the time and personnel intensive places to

junctions -- question "whereto?"
nodes -- " "whence?"
repetition -- " "why?"

While constant attention is paid to the expenditure / profit relation, there emerges a surprisingly simple working model for each station. But there also arises a flood of accompanying data on many carriers and decision aids. These masses of paper and data just demand the implementation of another technique - Data Processing Techniques. And this automatically means that the time has gone in which library was unnecessarily played at many points.

Seen egocentrically, the new structure of the library resembles a merry-go-round with Data Processing being the flywheel, whereas in reality it is only a component part of a service system. (Fig. 4)

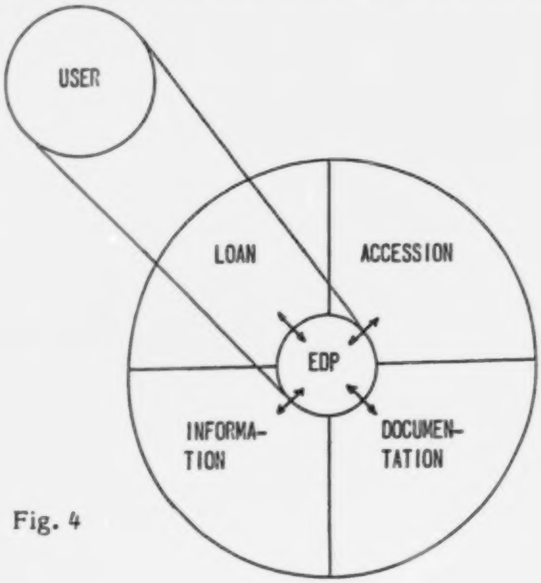


Fig. 4

Thus the integration of the user into the system can be seen and readily accomplished.

Having given life to this scheme, we now begin with the more difficult task of bringing the commercial part of the library nearer to Data Processing Techniques. We will not talk about the difficulties already arising in discussions on proven methods and successful procedures of the classical time, nor about the various historic petty dukedoms such as Report Acquisition, Dissertation Acquisition, Exchange Section, where personal relations and a brillant memory of a to-be-pensioned-off member of staff had to be transferred to digital dimensions.

And after all has been done, what does it all look like?

The first library activity is initiated - just as evolutionary as egg before hen - by an external literature demand. This can be a loan request sheet, xerographic citation, telephone call, entry in the book of desiderata, or best of all a publisher's handout, or, worst of all, the user in person. But nearly always it is an "ill-posed problem", which has to be solved by the following steps

recognise what is meant
add what is missing
check whether in stock
argue whether to be bought
order
make available.

One part of these activities results in data sets which are recorded in named fields at computer-aided working-places. Another part needs not only the same technical support but moreover the accessible Online Data Base.

The second library activity is initiated by that stream of printed matter which, depending on

kind of literature
kind of acquisition
decision on extent of cataloging,

will suffer different kinds of data processing.

Finally the postulation of an almost-perfect data processing system will come up. This means no less than that the data are not only fed online into the system, but in real time into the data base; regardless of whether it concerns first input, additions or corrections.

That is a system which does not need intermediate storage in a so-called work file, queue file, sequential file or whatever the excuses are called for a failure of real interactive data processing. Updates on a monthly, semi-monthly, hourly basis may be tolerable for pure retrieval purposes, but not, however, for seat reservation systems of KLM or library procedures of the aforementioned kind.

So the usual, quasi by law of nature, retardations of a book passing through the library are reduced by means of parallel and sequential processing at different stages.

Thus the main demands,

> quick evidence of a book and its state of processing, together with the economic advantage of avoiding unnecessary duplicate ordering of the same item

are fulfilled.

Now a few words on loan procedures such as they are already practised in many libraries. The first and best example is seen at Loughborough University Library.

If the user is identified by

user label

0002706181
ZB SCHROEDER KURT.DR

and the book by

book label

1084001234
ZB B 034561*01* 002

We need only some technical stuff in addition

printer	for the bar-code
reader	"
intelligent terminal	
software	

and in case of larger data amounts to be processed

DRT	
computer	
storage	for the bibliographical data, represented by labels
software	by means of which not only
reminders	can be printed but also
statistics	reckoned out.

Statistics of analyses and samples by which a library can vindicate its acquisition policy - or cannot do so.

For instance, depending on the subject matter

the time lag between acquisition and first lending of the book

the age distribution of the literature on loan relative to printing year or publication date.

It proved much easier to plan and execute the introduction of data processing techniques in the field of information procuration, identification methods. As already mentioned, about 12 years ago about 1/3 of the manpower of the 15 subject specialists of the library - even today these are academics who have spent many years in research activities - were used up by manual literature searches. It took about 17 hours to search and sort the answers to one query. Whereas now - during a period of 12 months and at the expense of about 3 manyears - we have at least increased our information service productivity tenfold. Thus we had more than 500 retrieval sittings to answer queries immediately by means of online connections to a selected number of German, European and overseas hosts. Generally, these sittings are in the presence of the user who either comes to the library or is visited by the information officer carrying a mobile terminal, or the terminal at the scientist's office can be used. Someone in the happy position to work with such a large computer configuration as in Fig. 5 would be at fault not to calculate on it, if he could but were not willing ; similarly, the library with its will to use EDP, would be at fault not to take advantage of it to optimise its literature searches.

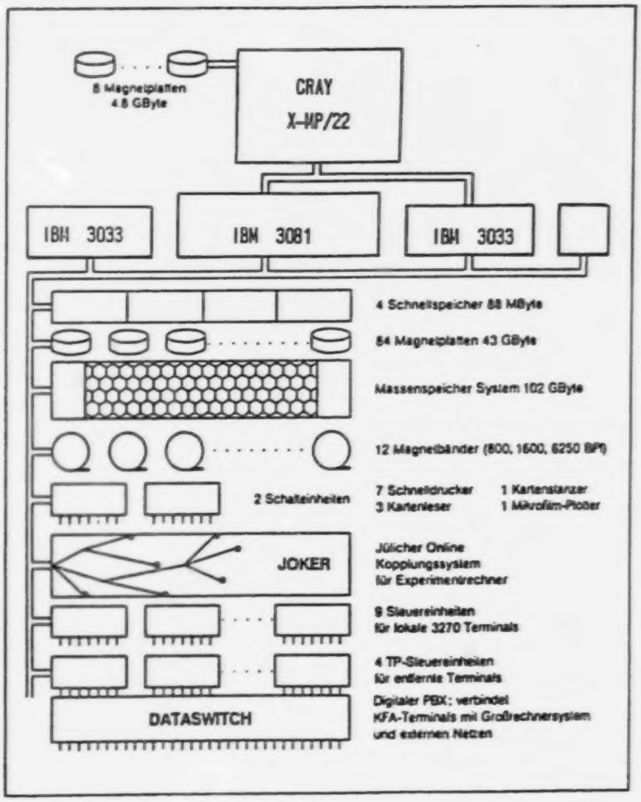

8 Magnetplatten
4.8 GByte
CRAY
X-MP/22
IBM 3033
IBM 3081
IBM 3033
4 Schnellspeicher 88 MByte
84 Magnetplatten 43 GByte
Massenspeicher System 102 GByte
12 Magnetbänder (800, 1600, 6250 BPI)
2 Schalteinheiten
7 Schnelldrucker
3 Kartenleser
1 Kartenstanzer
1 Mikrofilm-Plotter
JOKER
Jülicher Online
Kopplungssystem
für Experimentrechner
9 Steuereinheiten
für lokale 3270 Terminals
4 TP-Steuereinheiten
für entfernte Terminals
DATASWITCH
Digitaler PBX; verbindet
KFA-Terminals mit Großrechnersystem
und externen Netzen

Fig. 5

BEST COPY AVAILABLE

Thus we match monthly, on our batch machine, the INSPEC-tapes and the library's new accessions of monographs, reports and dissertations with about 600 profiles. The programs - needed to process the data bank, wordlists, searches and so on - were modified together with an international IBM-TEXTPAC user group.

The present quality produces
joy and praise of the users
dread and awe in our rivals
owing to price and comfort of further processing of the output.

I may just mention one of our current experiments with the INSPEC database. The Analysis of Neighbouring Words or Word Surrounding Analysis.

As you know, the usual retrieval method finds defined strings of characters in a data bank by means of uniterms, phrases, descriptors, ... applying rules of Boolean algebra - AND -OR - NOT -
Every more exacting retrieval method has additional syntax operators such as
(W) = ADJ =
WITH
(F) = SAME
and others, with which to find in texts (titles, abstracts) combinations of strings of characters as connected notions. Sophisticated retrieval methods permit, by means of "total truncation", the retrieval of character sequences of which only the number of characters is given.

All retrieval methods, however, have, in common that only named sequences are searchable. In other words: the best question can be put, if the answer is known. Now, to formulate the best question, we go beyond the KWIC/KWOC index and use the refined quality of the data bank generation in our retrieval system where, apart from the inverted files, there exists an address file containing
document number
segment number
field number
sentence number
word number

This enables us to find the left or right neighbouring terms of a randomly chosen significant word at any distance and list them in relation to their frequency or in alphabetical order. It is necessary to have a very carefully prepared stopword list to do this.

This gives the following applications or benefits:

New perceptions are published by means of
not yet used uniterms or
new syntactical combinations of already known uniterms
The first are found by a TEXTPAC subprogram, the latter by means of the aforementioned iterative procedure. After the listing, it is, of course, necessary to decide mentally on the significance of the new findings.

As long as no sense-understanding automator or sense-recognition exists, i.e. computers of the nth generation, the human mind still has to do this. The procedure now is relatively simple.

The retrieved left neighbourhood of a significant term S of a start sample - minus the stopword combinations - is analysed, i.e. checked for relevance, and eventually added to the known terms of the set /L. In a second run the right neighbours of these elements are checked for relevance and eventually added to the set /S. This procedure can be reiterated ad libitum and converges.

Mathematical linguists should be able to prove this by means of entropy. We use this procedure at the moment for a small subject section in a batch version to improve our SDI profiles.

But before the thus retrieved useful combinations of terms are entered into the SDI profiles, they have to pass a simple algorithm. Otherwise one writes until the fingers ache.

This is necessary, since to our knowledge no retrieval method so far can work on a command chain

/L ADJ /S

and furthermore, to the horror of the retriever, a weaker formulation

/L AND /S

with many elements in the sets /L and /S results in OVERFLOW.

The algorithm used takes account of the possibilities of the retrieval method in question, how profile elements can be run in character/line/block mode, or also, how the logical steps in a query concept have to be built up as regards number of operators etc. Of course, in place of connections and operators other characters can be used, such as a hyphen, blanks or just nothing. This is profitable with subsets of the Periodic System, where desired mutual combinations of chemical symbols can easily be generated.

This and further expense by means of data processing and enthusiastic staff members should produce somehow measurable results. And so we repeated the counting, which should show the age of cited literature. Again about 100 publications in the field of Solid State Physics

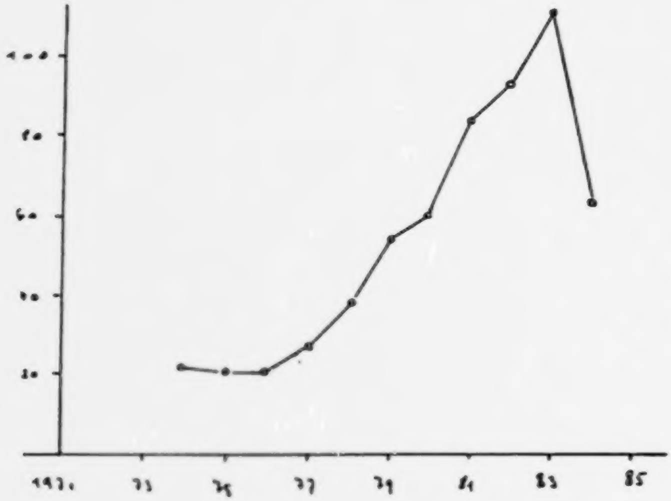


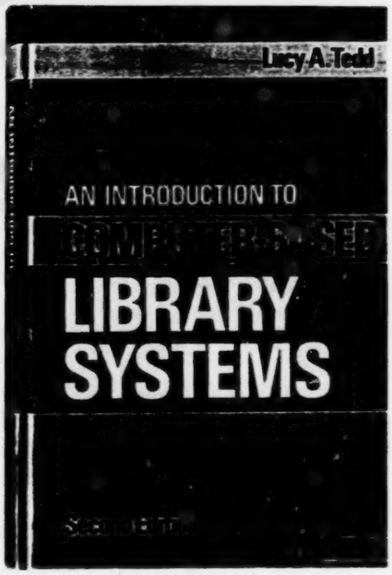
Fig. 6 Age distribution 1984

Here you see the expected and desired translation of the maximum to a newer date; it lies now at one year.

If one day the age has gone into the negative region, then beside the author's name you will only read

to be published

The future lies behind us.



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Chapter 7: ACQUISITIONS AND CATALOGING SYSTEMS
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AUTOMATED CATALOGUE AND THE USER - HELSINKI EXPERIENCE

Sinnika Koskiala

Helsinki University of Technology Library, Espoo, Finland

Abstract

Experience with the online catalogues of Helsinki University of Technology Library has shown a number of advantages compared with the former card catalogues.

1. Improved information retrieval both when the user carries out a document search and when he makes a subject search.
2. Remote access, appreciated especially by industrial users, but also by users on the campus.
3. User education is requested even by senior users and contacts with this user group are improved.
4. The coverage of the total library system including departmental and institutional libraries, gives the users an equal service in both the small institutional library and the main library.
5. By-products, such as monthly accessions lists, COM-cumulations and printed catalogues of departmental libraries raise the service level and satisfy requirements of the users.
6. Users concentrate their loan requests on material held in the library and to a lesser degree on material not held in the library.
7. Online-ordering saves time for the user, who no longer needs visit the library or telephone the staff during opening hours.
8. Student users especially have learnt to use the COM-catalogues with a greater skill than the card catalogues.

At the same time some drawbacks have been noted.

1. Users complain about service periods when the computer is down, although COM-catalogues are available.
2. Errors found by the users in the files are not often reported.
3. Costs grow to some extent for extra-mural users, who have to pay for the computer time and for the subscription of COM-products.

The library staff is the most content user group, as it has been able to improve the service level and decrease tedious work like filing. That every staff member wants a terminal, not only in the office, but also for home use, and that a micro computer stands high on the list for several staff members, is, however, another story.

Introduction

Since the spring of 1981 when the catalogues of the Helsinki University of Technology Library became available for searching online, observations and comments have been collected from the users regarding the accessibility and ease of use of the catalogues as well as changes in user attitudes and behavior toward the new automated versus the old card catalogue. This paper is a brief discussion on the conclusions arrived at examining the feedback so far received.

Background

In 1980 the Helsinki University of Technology changed over to computerized cataloging. The card catalogue was closed and COM-fiche catalogue established. From spring 1981 on the catalogues have also been searchable online and presently include about 55 000 records. The TENTTU-system actually consists of several databases, the most important of which for the present discussion are the following: the library catalogue, TENTTU-BOOKS, which includes monographs, reports, dissertations, conference proceedings etc. from the beginning of 1980. This database contains about 40 000 records. The periodicals catalogue, TENTTU-SERIALS covers the total serials holdings of the library, with information about the volumes and years held, and includes presently about 15 000 records.[1,2]

The TENTTU-system was developed inhouse but uses Swedish 3RIP software on the DEC 20 computer at the University of Technology. The advantage of the 3RIP software is that it is an interactive information retrieval program, which allows a dialog with the user. The user can give search statements and commands and answer questions put by the program. 3RIP is a very flexible program, yet easy to use even by the beginner. The program is always in a search mode, unless otherwise specified, so that the program interprets a given word, or a string of terms, as a search statement and searches for the references in which the word in question appears. If the search type has not been otherwise defined, the search is directed automatically to the basic field which includes the title and some other information. The program will not be discussed here in more detail since it has been introduced previously at these meetings.[3]

Two important features need to be noted here: TENTTU has an online ordering facility for loans or copies of the retrieved publications, and a UDC-index online, as an added help mechanism for users of the automated catalogue searching in a multilingual database.

TENTTU is used by the library staff, the faculty and the students alike. Not only are researchers and students using it in the library, but all over the university TENTTU is used directly at the various departments. In addition, since the University of Technology Library is the National Resource Library of Technology in Finland with the mandate to serve all who need technical information, TENTTU is available for external use. These external users include a large number of industries, other enterprises, institutions and individuals who either constantly or occasionally need technical information in their operations. All these users can request their own password to the system from the University Computing Center. The extent of the remuneration required for use depends on the user status. On the spot use in the library is free for all. Training for the use of TENTTU is provided, by the Information Service Department of the library, in frequently held half-day workshops which include hands-on experimentation.

User Reactions to the Automated Catalogue

How have the users of TENTTU reacted to the automation of the catalogue? The collected feedback, both solicited and unsolicited, from the various groups of users over the past three years, usually in the form of an unstructured interview in person or over the telephone, has clearly indicated that the automated catalogue is much preferred to the former card catalogue. This user feedback has led us to the following conclusions about the advantages of the automated catalogue:

1. Improved information retrieval both when the user carries out a document search and when he makes a subject search. As mentioned by Dr. Verpoorten[4] in an earlier presentation, entrance requirements to the catalogue are lowered for the user in an online catalogue compared to the card catalogue. In TENTTU this is facilitated by the interactive search mode the system is always in, unless otherwise specified. No card catalogue can offer this kind of access level, that is, access level using any word in the basic citation.

2. Remote access appreciated especially by industrial users but also by users on the campus. No more need the users come into the library just to find out what the holdings are. Dr. Fjällbrant[5] discussed earlier the reasons for non-use of academic libraries. Some of the variables pointed out by her were, unawareness of the resources available, and distance. The public access online catalogue effectively combats both of those aspects and it acts as a promotion tool about the collection to external, as well as internal, users.

3. Users concentrate their loan requests on material held in the library and to lesser degree on material not held in the library. This has been noticeable in regard to the interlibrary loan requests. The possibility of easily checking in the online catalogue is eliminating the wide margin for guessing.

4. User education is requested even by senior users and contacts with this user group are improved. At the University of Technology, the access medium to the online catalogue, the computer terminal, is a unifying tool between the technologist and the library. It creates the kind of interest and enthusiasm which has never been aroused by the card catalogue.

5. The coverage of the total library system, including departmental and institutional libraries, give the users an equal service in both the small institutional library and the main library. The physically decentralized library resources are thus equally available to the whole user community.

6. Byproducts such as monthly accession lists, COM-cumulations and printed catalogues of the departmental libraries raise the awareness and service level and satisfy requirements of the users. The ease of producing specialized lists for specific purposes gives confidence in the flexibility and user friendliness of the system.

7. Online ordering saves time for the user who no longer needs to visit the library or telephone the staff during opening hours. When Dr. Fjällbrant discussed the reasons for the non-use of libraries some important aspects were poor access and availability, such as, for instance, restrictive hours of opening. The online ordering facility offers alleviation from this restriction.

8. Student users especially have learnt to use the online, as well as COM-catalogues, with greater skill than the card catalogues. More and more the technology student is familiar with computers and eager to use them for any and all functions, whether study related or relaxation, such as computer games. When the terminal becomes a commonplace tool such as the telephone is at present, it will be used without a second thought. Card catalogues often seemed to give rise to second thoughts.

Not everything about the automated catalogue is fine and dandy, though, some drawbacks have also been noted:

1. Users complain about service periods when the computer is down, although COM-catalogues are available. Though the system is very reliable, there are obvious downtimes and also times when the response is slow. Patience seems to wear thin very quickly at the terminal. This may be due to the normally quick response.

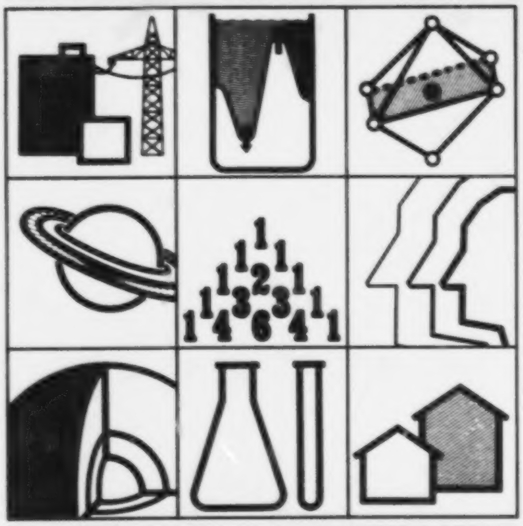
2. Errors found by the users in the files are not often reported. Nobody is perfect nor is any system, and cataloguing data is bound to have errors every now and then. Very seldom do the users notify about an error they have encountered, though notification would usually mean a quick correction and elimination of this annoyance next time.

3. Costs increase to some extent for external users who have to pay for the computer time and for the subscription of COM-products. When the increase in monetary costs is balanced against the ease and convenience of access provided by the automated catalogue, this is not a big issue of discontent and seems to become less so as time goes by.

On the whole there is an agreement that the automation has provided real progress in terms of making the information in the collections of the University of Technology Library more accessible to everyone.

References

1. TENTTU manual. The online catalogues of Helsinki University of Technology Library. Espoo, 1982.
2. Helsinki University of Technology Library Guide. Espoo 1982.
3. HAARALA, A. R. End-user training in the use of online catalogues. TENTTU at Helsinki University of Technology Library. IATUL Proceedings, 14 (1982) pp. 129-131.
4. VERPOORTEN, M.O.L. Trade-offs in the design of an online public access catalogue, exemplified by VUBIS. Paper presented at IATUL Conference, July 31, 1984.
5. FJÄLLBRANT, N. Promotion and marketing of library services. Paper presented at IATUL Conference, July 31, 1984.



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ONLINE DATABASES AND LIBRARY USER EDUCATION - AN INTRODUCTION

Lucy A. Tedd

Aberystwyth, U.K.

Abstract

This paper will provide a general overview of library user education with respect to searching the external online databases. The distriction between education about such facilities and training end-users to carry out their own searches will be drawn. Ways in which users might be educated, or trained, will be described along with details of aids available to assist the "teacher". Help provided by the various host services in this area will also be briefly described.

The growth of local microcomputer-based systems and the possible implications for library users creating, maintaining and searching their own databases will also be highlighted.

The paper will conclude with a list of questions which might face any one involved with this aspect of library user education and which could form the basis for a discussion following the paper.

1. Online databases

When we talk about online databases we are referring, mainly, to the collections of publicly available bibliographic records (e.g. INSPEC, COMPENDEX, CAS....), such databases are available for online searching via host computer services (e.g. Dialog, ESA-IRS, Pergamon-Infoline, Télésystèmes) through telecommunications networks such as IPSS and Euronet. However, many academics are beginning to create 'local' collections of their bibliographic references and this will have an impact on library user education. These references may be 'downloaded' from an external search service or may be entered locally. Increasingly such databases are being stored, updated and searched on microcomputers.

2. Education vs. training vs. marketing/promoting.

Williams[1] differentiates between these, with respect to the online use of bibliographic databases in the following way. Education is concerned with the fundamental principles and basic knowledge of information science and how they relate to search strategy formulation, bibliographic database structures, users' needs and so on. Training is concerned with the details of specific databases and search systems, their interaction and ways of optimising their use. Marketing is concerned with making target groups aware of the services and their advantages.

We discussed marketing and promoting during yesterdays sessions and so in this session we will be concerned with education and training aspects for "end users".

3. Factors affecting the design of a course on the use of online databases for end-users.

When it has been decided that library users should be educated or trained about online databases then there are various factors affecting the design of such a course that must be resolved by the teacher. These include:

- the context of the course. Some courses about online databases and information retrieval generally are integrated into the students' curriculum and may even form part of their assessed work. Sometimes information about the use of online databases is included in a general introductory session about the library or there may be a special course on library resources for post graduate students. Sometimes library staff are involved on short courses being run for practitioners at the university and may be asked to describe current techniques of bibliographic information retrieval.

- general aims of the course. This will vary from perhaps a 1-hour general introductory level (which would count as education) to perhaps a concentrated 3-day course in which students were taught how to carry out their own online searches (which would count as training)

- likely number in the group. The teaching techniques adopted will be influenced by the number in the group.

- time available

- money available. This is a very important consideration as it will affect how many, if any, 'live' searches are carried out during the course.

- outside help available. Some of the help which might be provided by the host services will be described later.

- range of services and databases used by the library.

- number of terminals and outside lines available. This factor affects the amount of 'live' searching that might be included in the course.

- other equipment available. There are now a number of programs available, especially for use on microcomputers which simulate the searching of the real systems, some of these will be referred to later.

- amount of "hands-on" time thought to be necessary.

- number of possible teachers and assistants.

4. Possible components.

When designing a course for end users on online databases the components, or modules, to be included will vary depending on the factors outlined above. These possible components might include:

- a general introduction. This might include an overview of the existing services, number and subject range of existing bibliographic databases, details of equipment, telecommunications and search language.

- a specific introduction. This component would include details of a particular bibliographic database (record structure, coverage etc.) and the ways it can be searched on a particular service. Thus, details of the command language would be included as well as information about the equipment.

- search strategy formulation. Ways of formulating commands in response to a particular request for information, and a discussion of the references retrieved (and perhaps not retrieved) would be included in this component.

- practical work. There is a variety of types of practical work which can be carried out by the course participants prior to, or in parallel with carrying out real 'live' searches. This includes using specially prepared work books, completing paper exercises (perhaps prepared by the teacher), running simulations, answering an online questionnaire and so on.

- live searching. If the course participants are to carry out their own searches then the teacher needs to decide on possible search topics, or may leave the participants to choose their own. Also it must be decided whether participants are to carry out live searches on their own or in small groups. Alternatively participants may not do their own live search but the teacher may demonstrate the process. Again the subject of the search must be selected - either in advance by the teacher or as suggested by one of the participants.

- assessment of search results. If participants have carried out their own searches it is usually a good idea to have a session analysing the search strategy used, looking at what references were retrieved, and why, and also thinking about what references were not retrieved.

- practical aspects of using the search service within the university. This component is necessary if the end-users are expected to be carrying out their own searches and so need to know about passwords, logging details of the search, location of the manuals and newsletters and so on.

- final discussion and evaluation session.

5. Education and training aids

Alina Vickery[2] and Guy[3] provide useful details of the various aids available. Guy categorises these aids in the following way:

- non-interactive. These are mainly audio-visual aids such as films, video-cassettes and tape slide programmes. In addition searches may be recorded, and then played back, using cassette tapes.

- interactive computer-based aids. The British library schools (sometimes encouraged by funding from the British Library Research and Development Department) have produced a wide range of simulations and emulations of the online search services to assist in education and training. A simulation, such as the FOSSILS package which was produced at Sheffield University in 1978, guides students through prepared searches with each step in the search process being explained before the student is invited to enter the next appropriate search statement. In an emulation the student is free to use any of the available commands, in any order, of the chosen service to search a local database of bibliographic records. Day and others[4] provide a software bibliography of such aids available in 1983. Livesey[5] describes a package being used at Leeds Polytechnic and Caruso and Caruso[6] describe the use of the TRAINER package in training public and international affairs students.

- Partially interactive systems. Searches recorded or a cassette tape may be modified to allow a degree of guidance by the user; stop codes can be added and some explanatory details about the search strategy.

- print based materials. System and database guides, text books, serials, newsletters and work books all come into the category of print-based teaching aids.

- kits incorporating two or more aids.

6. Possible help from the 'host' online search services.

The various hosts can offer help in a variety of ways. Some offer assistance in running courses in a particular library or information unit. All produce a variety of printed aids (systems manuals, database guides, terminal cards etc.) which can be used when appropriate. Some host services have produced self-teaching aids such as workbooks and kits. The UK service, BLAISE, for instance, has produced workbooks (with paper exercises, terminal exercises, and answers) for use with the MARC and Medline databases. Another UK service, Pergamon-Infoline has produced a sound cassette and booklet (known as INFOTAPE) which is designed to be used "live" with the Pergamon-Infoline search service. Another way in which the host services provide practical (and financial) help for education and training is by reducing the connect time charge levied for each database. Dialog, for instance, in its Classroom Instruction Program makes the majority of its databases available for $15 per hour to academic institutions which are using these databases "in the formal instruction of students in the techniques or databases used with online searching." Also, some hosts have special "training" databases which usually contain a usable sub-set of records from a major database. ESA/IRS for instance has the INSPEC and PASCAL training files and Dialog has various ONTAP databases (ONTAP ABI/INFORM, ONTAP BIOSIS Previews, ONTAP CASEARCH, ONTAP CAB ABSTRACTS, ONTAP ERIC and some 9 others).

7. Micro-computer aspects

Increasingly micro-computers are being used as 'intelligent terminals' to the external online search services. Several software packages (e.g. Assist[7], Connect, Headform/-Headline, Swift[8] are becoming available in this area and other work is in progress. Williams and Goldsmith[9] describe research at the University of Manchester Institute of Science and Technology on a completely automatic information retrieval system for the unskilled user and Citroen[10], of TNO in Delft, describes work on a package to allow up to 3 searchers to have simultaneous access, via the micro-computer, to online hosts.

Having acquired a micro-computer, perhaps primarily for online searching, there are many ways in which it might be used and Gates[11] provides a useful software directory of software packages, currently available on micro-computers, which might be of use in libraries.

Micro-computers can prove to be a useful education and training aid. Nordstedt[12] describes a study on the use of a Superbrain micro-computer for online user training. Several of the packages referred to by Day and others[4] run on micro-computers.

Another area of current interest is that of library users creating local, or personal, databases on micro-computers (this is sometimes referred to as PRK systems or personal record keeping). Gates[11] includes details of some software which could be used for this.

It can be seen that the library, perhaps in conjunction with the university computer centre, could have a role to play in educating its users about the potential, and use of, micro-computers for online databases. The Central Information Service at the University of London, for example, has run courses in this area for a few years and topics planned to be covered in the 1984-5 range of courses include:

- micro-computer appreciation for beginners
- micro-computers and online searching
- database design for micro-computers
- WORD-STAR for beginners
- file-handling in BASIC.

8. Questions arising

There are various questions regarding online databases which face the library user educator. These include:

- am I aiming to train library users to carry out searches themselves or am I aiming to educate them about the possibilities. Brooks[13] discusses some of the implications of "non-mediated usage" of search systems.

- if I train how do I ensure that all trainees are kept abreast of developments in systems, databases, access methods etc. and how do I control the use made of the services.

- how do I decide which teaching aids are most appropriate for my needs and do I need to make any aids myself.

- how much should I get involved with micro-computer systems and educating the library users as to their potential.

Finally, I feel I should refer readers to an excellent chapter on education for online information retrieval in Fjällbrant and Malley's recent book[14].

References

1. WILLIAMS, M.E. Education and training for online use of databases. Journal of Library Automation, vol. 10, (1977) no. 4, pp. 320-334.
2. FJÄLLBRANT, N. (ed.). User education in the online age. IATUL Proceedings, vol. 14, 1982.
3. GUY, R.J. Training aids for online instruction: an analysis. In: Proceedings of the 7th International Online Information Meeting 6-8 December 1983. Oxford, Learned Information, 1983, pp. 353-363.
4. DAY, J.N. et. al. Directory of new technology in use in UK schools of library and information studies. Newcastle-upon-Tyne Polytechnic, 1983.

5. LIVESEY, J.B. DIASIM: a Dialog simulator. To be published in Program vol. 18 (1984) no. 4.

6. CARUSO, N. & CARUSO, E. TRAINER - a computer tutorial for end-users of data-base services: context, content and results of use. Information Services and Use, vol. 3 (1983) pp. 191-8.

7. WALES, J.L. Using a microcomputer to access bibliographic databases: experience with Userlink software in the ICI Organics Division Information and Library Services Unit. Program, vol. 18 (1984) no. 3, pp. 247-257.

8. PETRIE, J.H. & COWIE, J. A microcomputer-based terminal for assisting online information retrieval. Journal of Information Science, vol. 4 (1982) no. 1, pp. 61-64.

9. WILLIAMS, P.W. & GOLDSMITH, G. A completely automatic information retrieval system for the unskilled user. In: Proceedings of the 6th International Online Information Meeting, London, 7-9 December, 1982. Oxford, Learned Information, 1982, pp. 263-272.

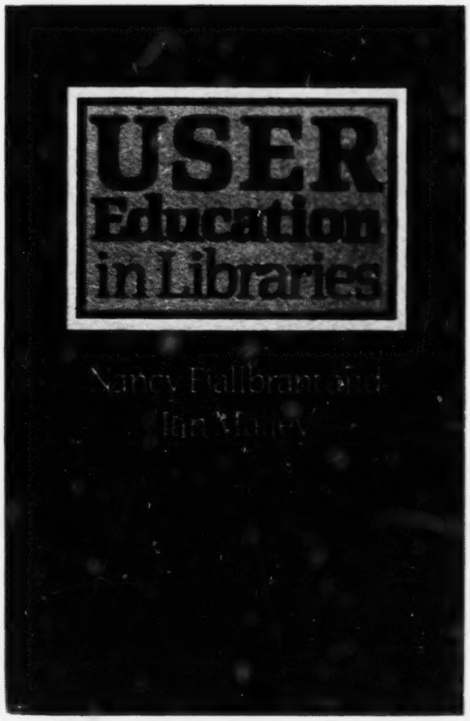
10. CITROEN, C.L. Multi user microcomputer-assisted access to online systems. In: Proceedings of the 7th International Online Information Meeting, London, 6-8 December 1983. Oxford, Learned Information, 1983, pp. 37-44.

11. GATES, H. Library software for microcomputers. Oxford, Cairns Library, 1984. (BLR&D Report No. 5798.)

12. NORDSTEDT, J.R. Study on the use of microcomputer programmes for online user training. Göteborg, Chalmers Tekniska Högskola, Biblioteket, 1983. 46 p. (CTHB-Publikation Nr. 32)

13. BROOKS, K.M., Non-mediated usage of online retrieval systems in an academic environment. In: Proceedings of the National Online Meeting 1982. Medford, New Jersey, Learned Information, 1982, pp. 35-39.

14. FJÄLLBRANT, N. & MALLEY, I. User education in libraries. London, Bingley, 1984. 251 p.


USER Education in Libraries

Nancy Fjällbrant and Ian Malley

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Second edition

NANCY FJÄLLBRANT
and
IAN MALLEY

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ON-LINE SEARCHING IN A CHEMISTRY CURRICULUM

Leendert Maat

Delft University of Technology, Delft, The Netherlands

Abstract

A university is a special type of user of on-line information. It makes use of information to do high level research; a university also produces the on-line information user of tomorrow.

Many activities in a university have to do with the huge amount of information surrounding us. There is, therefore, a need to teach students how to deal with information problems. It is not always easy, however, to find the appropriate moments in a curriculum for such lessons.

In this contribution, several aspects of teaching on-line information techniques in a chemistry curriculum will be discussed. Examples will be demonstrated from some years of experience in our Department of Chemical Technology.

Introduction

In 1974, the Department of Chemical Technology decided to introduce a course on "Library use and literature searching" in the curriculum. Up to then, students had learned the use of the library in some laboratory courses, such as that of organic chemistry, and in occasional lectures on the subject given by the department librarian or a staff member. The main reason for starting with a systematic course in the curriculum was the marked increase in growth of information and, with this, the increasing complexity of access to the primary information sources. Another important reason was the fact that sometimes students started their research projects with too little knowledge of the potential of literature retrieval. Obviously, the latter group of students had followed a series of courses where they missed (or perhaps could escape from) literature searching.

The task of teaching "Library use and literature searching" was allocated to (me) one of the scientific staff members of the department as a part-time job.

On-line literature searching forms an important part of the lectures. To indicate its proper place in the curriculum, the whole programme of library use and literature searching will be briefly described. Problems which are encountered in practice will be discussed. Two examples will be mentioned to illustrate different opinions about on-line searches.

Programme

In order to make a programme of lectures and exercises, one has to know the final goals of education of the faculty. Among others, these goals dictate the ability of the student: (i) to keep abreast of current developments (by means of the "literature"), (ii) to collect all relevant information for new projects (from the "literature") and (iii) to report in a proper and concise way (and contribute to the "literature").

Of course, when there is enough time, the majority of the students can find out how to deal with these subjects from the different courses and lectures. However, the newer curricula are compact and a lot has to be done in a relatively short time. This is, in fact, another reason for educating the students in a systematic way to use the library as efficiently as possible.

First year

In the first year, a course of seven hours (1) is given. This course treats the access to the collections of the Department and Central libraries. It comprises an introduction to the different catalogues, handbooks with numerical data, encyclopaedias, scientifical journals, Chemical Abstracts, Beilstein's Handbuch der organischen Chemie, and Gmelin's Handbuch der anorganischen Chemie. Some time is used for discussing nomenclature problems encountered in the literature. On-line literature searching is mentioned, especially in those cases where problems arise concerning the keywords of search profiles.

The course, which is compulsory for all first year students, is concluded by a test of five questions (2).

Second year

In the second year there is no systematic treatment of literature searching but in several courses information has to be found from the library. For example, in the laboratory course of organic chemistry (120 h) different preparations of at least three compounds have to be found via Chemical Abstracts and/or Beilstein. Because of the limited amount of time available such a search may be restricted to, for example, a period of ten years' literature coverage.

Third-fourth year

In the second half of the study, four lectures are devoted to advanced aspects of literature searching. These - also compulsory - lectures comprise all kinds of information sources, some further aspects of Chemical Aspects, Science Citation Index, Dissertations, Patents etc. and on-line searching. We think this the better level for teaching on-line searching, because the student now knows the library and has obtained some experience in literature searching. Moreover, the student is better aware of the fact that he can apply on-line searching for his own research subjects.

After an oral introduction, the students have to study the subject from a manual (3). The course is finished by a demonstration of on-line searching, and a first exercise. Examples for these exercises are usually taken from laboratory courses and must be prepared by the students.

Finally, usually in the fourth year, each student applies on-line literature searching to his research project (600 h) and/or a written report based on the literature ("treatise", 120 h).

Problems

The whole series of lectures and exercises encounters some problems of which the most important are:

- First year students, especially those of universities of technology, are not much aware of the importance of information. They are eager to do investigations. Some are still at the stage of the chemistry of fireworks or of developing photographs, others hope to solve world problems with a few experiments. Many students are seeing a good job ahead. Only a few know the way to the library.

- The first lectures on library use and literature searching have been introduced in an early stage of the curriculum. This has the advantage that from then on the students are able to find the information they need. But real literature searching begins in the second year, which makes it difficult to get the students enthusiastic for the lectures.

- Scientific staff members are not always able to check all the literature searches done by the students. In most cases there is not enough time. The professor is glad that he could obtain information on a subject related to his research, or which arose from his curiosity. Of course, he is able to judge the scientific value of the report, but corrections, and thus education about the facets regarding the literature search often fail to come into the picture.

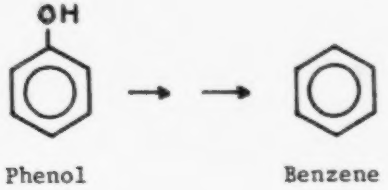
- Financial problems also play a role, especially with respect to on-line searching. One can distinguish between the costs of (i) the demonstration, (ii) the first exercises, (iii) the search by students for their "treatise" and/or study research project, and (iv) the searches purely for laboratory research projects or lectures. It is clear that the money for the latter on-line searches (iv) must come from the laboratory's own budget. The demonstration and first exercises are paid from the department's library budget. However, problems arise with the question of who will pay for the large group of students (iii) who partly contribute to the research of a laboratory and partly are still in the stage of learning. In my opinion, the library budget must allow every student to do at least one complete on-line search.

Examples

There is no need here to sum up chemical examples of on-line searches. It is more important to dwell on typical differences which exist between different searches. For our discussion we may compare a librarian example and one from everyday chemistry.

A librarian is proud - and rightly so - to show the potential of on-line searching with questions of a general type such as: "What is known of energy-saving fuel engines?". The scientist in this field will spend much time to optimize the appropriate search profile, and even more time to study the outcome of the search. This is what librarians expect from every scientist who does an on-line search.

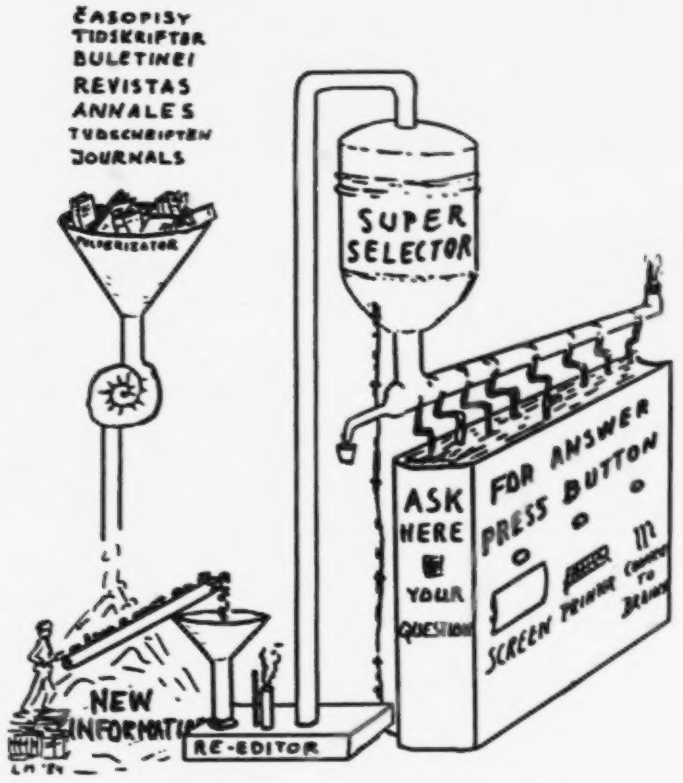
However, chemistry practice and that of many other disciplines is often quite different. After a laborious analysis of a complex reaction product, a chemist finds a strange and new structure. Then he wants to know if this structure has already been described by others or, for example, what can be done to convert it into a desired compound. Although this chemist may realize the complexity of obtaining the right answers to his questions, he still wants the answers immediately. In competition with his colleague chemists, especially at the level of detailed chemistry, he has not much time to stop his work: "Chemistry must go on". In a somewhat exaggerated way, one can say that the library can furnish complete information, but in a time in which the competitors may have done the experiments. Fortunately, good chemists in co-operation with good librarians always find acceptable compromises.



Possibilities for the synthesis of thebaine from 4,5 α-epoxy-3,6-dimethoxy-17-methyl-6,7,8,14-tetradehydromorphinan-2-ol can be found by changing the question to the conversion of phenol into benzene with the aid of key words such as dehydroxylation and deoxygenation of phenols.

Final remarks

Although we have in general user-friendly libraries, we think there is a need for practical user education. The library instruction is not given to keep us busy. On the contrary, with this instruction the students take up less time of the scientific staff. The set of lectures in the curriculum is not ideal. Like the possibilities of on-line searching, the lectures are in full development and are up-dated constantly. However, no student will leave our university without some knowledge of on-line information retrieval, particularly now that computer retrieval methods are common property in industry.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CONNECT TO BRAIN
NEW INFORMATION
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Despite the whole potential of on-line literature retrieval, the dream of the chemist at the bench is a simple information machine as depicted above.

Acknowledgements

It is with pleasure that I acknowledge the full support, both inspirationally and with respect to practical help, of our university librarian, Dr. J. Zandvliet, and his capable staff. I also want to acknowledge the fruitful co-operation with the department library.

Notes

1. One year study counts for 42.5 weeks each of 40 hours working time for an "average" student.

2. Examples:
    a. A literature reference says: Helv. Chim. Acta, 64 (1981) 568.
        - What is the full name of the journal?
        - Give other bibliographic data (authors, title of the article).
        - Give three (extra) key words not to be found in the title.

b. - Where can you find in "Kirk-Othmer's Encyclopaedia of Chemical Technology" information on the use of "citric acid in food"?
   - Give an abstract in about three phrases.

c. - What is the name for: "appelzuur (malic acid)", in German?
   - Give a synthesis of appelzuur from "Beilstein" in formula.
   - Where can it be found in "Beilstein"?
   - Where is the original article to be found?
   - What is the name for "appelzuur" in English?
   - Give the melting point and/or boiling point from the "Handbook of Chemistry and Physics".

d. In 1977 one article on "wolfraamboride" (tungsten boride) can be found in Vol. 87 of CA.
   - Find the article.
   - What is the abstract number?
   - Give the bibliographical data of the article.

3. M. van den Hondel and L. Maat, Kennismaking met online literatuuronderzoek (Getting Acquainted with On-line Literature Searching), Centrale Bibliotheek en Afdeling der Scheikundige Technologie, Delft, 2nd Ed., augustus 1982.

ONLINE LIBRARY REFERENCE DATABASES:
A NEW EDUCATION OF LIBRARY USERS

Maria Pia Carosella - Augusta Maria Paci

National Research Council, Rome, Italy

Abstract

This paper outlines the relevance of online library reference databases as complementary sources of information to the subject-oriented bibliographic databases. The main databases concerning the library itself are identified as: Library catalogues and national bibliographies, commercial catalogues of books, periodicals directories and others. Scientific and technical libraries offering online connection to these databases can avoid effort in coping with updating of their printed reference books and also avoid storage problems.

On the other hand library users have to be taught how to use these databases. At least three aspects must be considered in a users' education program:

1) description of the content of the databases
2) description of the searching techniques, both in terms of retrieval language and boolean retrieval logic
3) efficiency of an online search in terms of: update information, fast response time and search exhaustiveness, automatic output according to user's requirements.

This paper concludes with a list of the relevant databases.

For some time now computer science has been applied to library reference services and this has resulted in the establishment of a number of EDP systems for library work. Any single library or group of libraries, or even the national library systems may now exploit computerized systems for cataloguing, circulation or acquisition of books, journals etc.

In the field of bibliographic information, EDP systems have flourished mainly as a result of telecommunications technology, which has permitted access to remote sources of bibliographic information. The user can now access information in a variety of ways, he can visualize it at a terminal and/or request a print out. These on-line information retrieval services support, but do not replace traditional library services, and they are particularly useful for libraries which specialize in scientific and technical subjects. Indeed general reference books have always represented fundamental components of any reference library department and continue to do so. Reference librarians are continually called upon to look up information for those who do not have the means to do so themselves. It is thus hardly surprising that, in order to meet the information needs of users, and not just necessarily scientific users, that specialized data-bases have been created.

Given the importance that up to date information holds for a researcher or a scientist and given also the urgency with which he may require that information, it is clear that specialized data-bases, with information distributed by on-line vendors, will become more and more important.

Here it is our intention to discuss data bases of a multidisciplinary nature and others which cover all the activities across a given scientific field of study. We categorize these according to the traditional typology of the Guides to Reference books: library catalogues and national bibliographies, commercial catalogues of books, periodicals directories, biographical directories and encyclopaedias, conference proceedings indexes and other catalogues.

We believe that this criterion is all the more suitable and functional in the light of the fact that these information systems will soon be part and parcel of the cultural and professional training of whoever works in the field of bibliographic information. These data bases for reference are commercially available and should be considered as standard work tools for reference work, but with the specific characteristic of providing precise information at high speed and allowing multiple access. It may be that the use of such data bases may be justified only in specialized science libraries where the consultation of specialized on-line data bases is already in practice.

The possibility of on-line consultation greatly increases the potential of reference work and a library may offer reference services without necessarily having the information physically present. This is an advantage where the acquisition of the texts is costly or involves long delays or is not consistent with the existing library collection.

Library Reference Data Bases

Our choice of LRDBs was based on the information that they contained. In order to make a selection we considered ourselves to be users of library catalogues, commercial catalogues, bibliographic directories etc.

Before continuing, let us take a brief look at the many reasons which led to the creation of these data bases and let us also consider some special features of the host computers which contain and distribute the information. A few DBs came out during the 60's as a solution to editorial problems in a commercial environment (we refer here to the first bulletins of abstracts which are now automated).

Other data bases were produced by public bodies and were designed for bibliographic controls. As a result of the UNESCO, ISO, IFLA international projects including that of the Universal Availability of Publications (UAP), international standards were adopted for the description of publications. These achievements allowed, in addition, the growth of shared cataloguing for national library systems. Some of the data bases that we will deal with are commercial products, like their published counterparts, while others are public or institutional, concerning the host computers, we have considered only commercial organizations.

From our survey of Library reference data bases, we found that 34 % of the total of data bases (SEE APPENDICES A - H) are available on the U.S. DIALOG Information Service (DIS). This figure represents 7 % of the total of data bases offered by the DIS. In Europe 20 % of the data bases available are on the British Blaise-Line service. From these figures we can see that the library user can benefit from many reference sources in the United States on the DIALOG Information Service by means of a single retrieval language. On the other hand, in Europe this is not so since the data bases of interest are housed on various host computers which use different retrieval languages and which are not accessible in the same way.

A first step has been taken to rectify this situation by the Commission of European Communities with its study on the possibilities of a common command language (CCL). The result of this study has been an outline of a common retrieval language for the various European host computers. Subsequently the same Commission set up a second study for an Intelligent Interface Facility for Euronet/Diane with the aim of obtaining greater transparency between the many information resources available.

A new user education

We have seen how speed is an important factor in bibliographic research in scientific and technical fields and how the use of on-line data bases in certain circumstances may be extremely valid. It is important also to point out the value of the use of reference data bases for the user, and by user we mean not only the final user or whoever exploits the information, but also the librarian. This is due to the particular content of the databases in consideration here.

The reference librarian may now use a library reference data base - just as he once used the published reference works - either to respond to the enquiries of his library client or in the normal procedure of his daily work. In this latter case, the librarian himself becomes the final user. It is up to the reference librarian to decide whether the solution to a request may be found in the traditional publications, or whether it will also be necessary to refer to the data bases, which may be seen as a supplement and complement to the published reference works. The quality of his work will increase as a function of the use of these data bases, and if it is supported by the right education, then his service will become professionally more valid. It will be worthwhile remembering this type of user during the rest of the article even though we will not make any direct reference to this.

The consultation of L.R.D.Bs. increases the efficiency of the librarian while reducing the time it takes him to check or identify a piece of information which has been requested. Another factor to be taken into consideration is the psychological aspect. Many a user has felt frustrated by the limited potential of the library chosen for his research. By the use of L.R.D.Bs. which need not be physically present in the library, this problem may be overcome.

After these general considerations we would like to emphasize the real advantages that L.R.D.B.s. offer to the user. Let us cite in particular:

1. The possibility to receive up to date information long before it would normally be available through the traditional channels, that is by acquiring reference works;
2. the possibility to obtain the information in real time;
3. the processing of the output, that is of the result of the research carried out.

The third aspect seems particularly interesting. It permits us to choose:

1. the format of the information, whether one wants only the essential information or the full format record;
2. the ordering of the information, whether alphabetic or chronological. In the case of information retrieved from different files on the same host one can choose the merging or the sorting according to desired parameters;
3. the integration by means of a personal computer emulating the TTY terminal, of information retrieved from various data bases on different host computers.

The final result is personalized and printed bibliographic information with complete data. These alternatives meet the needs of users who, however, must be educated to be responsible in the use of these tools, in order to avoid wasting of time and money.

Just as those libraries which are more aware of the needs of their users, issue guides to the use of their libraries, we can reasonably foresee a campaign for the education of the user and this might take the form of a seminar on the following aspects:

1. general elements of on-line information;
2. advantages for the user and the costs for the library;
3. an elementary description of information retrieval techniques;
4. a description of the data bases that the library holds in complement to its bibliographic services.

Such a program could bring about positive results along two lines:

1. it could increase interest with regard to bibliographic services in as much as that service is keeping up with technological progress;
2. it could encourage greater user participation in the definition of their own informative needs.

This second case gives rise to reflections on the possible methodological developments resulting from an education of users:

1. greater facility for the user in defining his own informative needs in terms of primary and secondary concepts. Even normal library administrative procedures could contribute in an indirect way to this education, for example, the user could be asked to fill in a form on which he requests the services of a L.R.D.Bs. If the form is set out in such a way as to acquaint the user with the nature of automated procedures, then its use is certainly a positive aid.
2. The standardization of techniques for access to data bases, for what concerns the basic commands of the various languages, will bring specialized bibliographic research closer to reference work. This fact will unify in a certain sense the techniques and knowledge which divided the professional environment of the librarian from that of the expert in a subject, at least for what concerns the rapport with the client, even if in reality the librarian is himself an expert in other fields.

A - NATIONAL BIBLIOGRAPHIES

NAME	PRODUCER	UPDATE	ON-LINE SERVICE	CUMULATIVE SIZE
BIBLIODATA	Deutsche Bibliothek	1966 every two weeks	GID - SFT	1.200.000
BNI	Biblioteca Nazionale Centrale - FI	1975 (semimonthly)	CED (Corte Suprema di Cassazione)	106.583
HEBIS	Stadt- und Universitätsbibliothek, Frankfurt (Scientific Library)	-	GID - SFT	30.000
UK MARK	British Library	1950 weekly	BLAISE-LINE	853.000

B - LIBRARY OF CONGRESS CATALOG

NAME	PRODUCER	UPDATE	ON-LINE SERVICE	CUMULATIVE SIZE
LC/LINE	System Development Corporation	1968 quarterly	SDC	1.700.000
LC MARC	U.S. Library of congress	1968 monthly	DIALOG BLAISE-LINE	1.720.500
LIBCON	3 M Systems	1968 periodic updates	SDC	appr. 130.000 ref. x year
REMARC	Carrollton Press, Inc.	Cataloged Collection from 1897-1980 periodic updates	DIALOG	937.000

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C - COMMERCIAL CATALOGS OF PUBLICATIONS

NAME	PRODUCER	UPDATE	ON-LINE SERVICE	CUMULATIVE SIZE
ALICE	Editrice Bibliografica	1978 monthly	CILEA	185.000
BOOK EXPRESS PLUS	Brodart, Inc.	1950 weekly	BRODART; Inc.	900.000
BOOK REVIEW INDEX	Gale Research Co	1969 Three times per year	DIALOG	1.161.900
BOOKSINFO	Brodart, Inc.	monthly	BRS	600.000
BOOK IN PRINT	R.R. Bowker company	1900 monthly	DIALOG BRS	900.300
BRITISH BOOKS IN PRINT (BBIP)	J. Whitaker & Sons	available in 1984	BLAISE LINE	500.000
WILEY CATALOG ONLINE	John Wiley & Sons, Inc.	1940 bi-monthly	DIALOG	30.000

D - BIOGRAPHICAL DICTIONARIES

NAME	PRODUCER	UPDATE	ON-LINE SERVICE	CUMULATIVE SIZE
AMERICAN MEN AND WOMAN OF SCIENCE	R.R. Bowker, Co.	every three years	DIALOG BRS	140.000
BIODOC	Servi-tech	monthly	G. CAM	43.000
BIOGRAPHY MASTER INDEX	Gale Research Co.	Periodic updates	DIALOG	2.000.000
ENCYCLOPEDIA BRITANNICA	Encyclopaedia Britannica Inc.	-	MEAD DATA CENTRAL	-
MARQUIS WHO'S WHO	Marquis Who's Who, Inc.	1982 quarterly	DIALOG	75.000

E - SERIALS CATALOGS

NAME	PRODUCER	UPDATE	ON-LINE SERVICE	CUMULATIVE SIZE
CIRCE	Editrice bibliografica	quarterly	CILEA	8.000
ULRICH'S DATABASE	R.R. Bowker Publ. Co.	1977 monthly	DIALOG-BRS	114.300

F - CATALOGS OF CONGRESSES AND PROCEEDINGS

NAME	PRODUCER	UPDATE	ON-LINE SERVICE	CUMULATIVE SIZE
CONF	FACHINFORMATIONS ZENTRUM ENERGIE PHYSIK MATHEMATIK GmbH	1976 weekly	INKA	21.815
CONFERENCE PAPERS INDEX	Cambridge Scientific Abstracts, Inc	1973 monthly	DIALOG SDC ESA IRS	100.000
CONFERENCE PROCEEDINGS INDEX	British Library	1964 monthly	BLAISE - LINE	170.000
EI ENGINEERING MEETINGS	Engineering Information, Inc.	1979 monthly	DIALOG ESA IRS	85.000
MEETING AGENDA	Centre d'etudes nucleaires Saclay	semimonthly	TELESYSTEMES QUESTEL	-
ISI/ISTP	Institute for Scientific Information	1978 monthly	DIMDI ISI SEARCH NETWORK	720.000

G - DIRECTORIES OF DATABASES

NAME	PRODUCER	UPDATE	ON-LINE SERVICE	CUMULATIVE SIZE
DIANEGUIDE	ECHO-Service	-	ECHO-Service	-
DIRLINE	U.S. Library of Congress	experimental	-	-
REBK	Association National de la Recherche Technique	1983 quarterly	G. CAM	460

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H - OTHER CATALOGS

NAME	PRODUCER	UPDATE	ON-LINE SERVICE	CUMULATIVE SIZE
COMPREHENSIVE DISSERTATION INDEX	University Microfilms International	1861 monthly	DIALOG	819.000
DUNIS	United Nations Inter-organization board for informat. system (I.O.B.)	1980 once a year	ECHO	233 UN Information system (IS) 102 Databases/banks
ENDOC	Commission of the European Community	1979	ECHO	500
EURODICAUTOM	European Communities Commission	periodic updates	ECHO	300.000 70.000 accronyms
HELIOS	Commission de coordination de la Docum. Administrative e Document Francaise/BIPA	twice a year	TELESYSTEMES QUESTEL	560
REDOSI		1974 semimonthly	TELESYSTEMS QUESTEL	3.500
SCISEARCH	Institute for Scientific Information (ISI)	1970 semimonthly	DIALOG SDC DIMDI ISI SEARCH NETWORK	4.500.000
SIGLE	European Project	1981 every two months	BLAISE-LINE INKA	12.000
SOCIAL SCISEARCH	Institute for Scientific Information (ISI)	1972 monthly	DIALOG SDC DIMDI ISI SEARCH NETWORK	1.238.200
WORLD TRANSLATIONS INDEX	International translation Centre (NL) e Informascience CNRS (Fr)	1978 monthly	ESA - IRS	111.000

Information quoted A to H are from the following Directories of Databases:

1) Cuadra, Ruth N - Abels, David M - Wanger, Judith (eds) "Directory of Online Databases", vol. 4, n. 1, all 1982. Santa Monica, Ca, Cuadra Associates, Inc., 1982, pp. 290.
2) "EUSIDIC Database Guide 1983", Oxford-New Jersey, Learned Information, 1983, pp. 324.

and leaflets published by online vendors and databases producers.

The authors work in the Italian Referral Centre for EURONET/DIANE, which is part of the Institute of Studies for Scientific Research and Documentation of the National Research Council (ISRDS-CNR), Via Cesare de Lollis, 12 00185 Rome Italy.

References

1. BATES, M.J. Information Search Tactics. Journal of the American Society for Information Science, vol. 30 (1979) no. 4, pp. 205-214.
2. BATES, M.J. Locating Elusive Science Information. Some Search Techniques. Special Libraries, vol. 75 (1984) no. 2, pp. 114-120.
3. BUIATTI, M. Le esigenze dell'utenza scientifica. Bollettino d'informazioni AIB, XX (1980) no. 3, pp. 91-96.
4. COULAUD, P. La télematique documentaire à l'épreuve. Usages et usagers des bases de données à la B.P.I. Rapport de la Bibliothèque publique d'information CENTRE GEORGES POMPIDOU, nov. 1982, pp. 10.
5. DROESSLER, J.B. Online Services at the Reference Desk: DIALOG, RLIN and OCLC. ONLINE, vol. 7 (1983) no. 6, pp. 79-86.
6. FRIEND, L. & BONTA, B. Reference Use of Online Databases: an Analysis. In: Williams, M.E. & Hogan, T.H. eds. National Online Meeting. Proceedings. New York, March 24-26, 1981. Medford, Learned Information, 1981, pp. 213-220.
7. GABETTI, R. Le apsettative degli utenti. Biblioteche tecniche. Bollettino d'informazioni AIB, XX (1980) no. 3, pp. 97-100.
8. GOLOMB, K.A. & REISMAN, S.S. Using DIALOG for Ready Reference. Library Journal, vol. 109 (1984) no. 7, pp. 786-788.
9. HITCHINGHAM, E., TITUS, E. & PETTENGILL, R. A survey of Database Use at the Reference Desk. ONLINE, vol. 8 (1984) no. 2, pp. 44-55.
10. KLUGMAN, S. On-line InformationRetrieval Interface with traditional Reference Services. In: 3rd International Online Information Meeting, London,4-6 December 1979. Oxford-New York, Learned Information, 1979, pp. 63-72.
11. OULTON, A.J., Factors Affecting End-User Charges for On-Line Bibliographic Information Retrieval Service in Public Libraries. In: 3rd International Online Information Meeting, London 4-6 December 1979. Oxford-New York, Learned Information, pp. 35-44.

12. PERUGINELLI, S. Il controllo bibliografico universale: situazione a livello internazionale e prospettive nella costituzione del sistema bibliografico nazionale italiano. *Bolletino d'informazioni AIB*, XXII (1982), no. 3/4, pp. 13-24.

13. RICE, J. Telereference Services: the Potential for Libraries. *Library Journal*, vol. 108 (1983) no. 17, pp. 1839-43.

14. RIECHEL, R. Online in the Public Library: Automating the General Reference Desk. In: Williams, M.E. & Hogan, T.H. eds. *National Online Meeting. Proceedings. New York, April 12-14, 1983*. Medford, N.J., Learned Information, 1983, pp. 445-455.

15. RIECHEL, R. The Public Library and the Online News Database Experience: supplementing the Ready - Reference Collection. In: Williams, M.E. & Hogan, T.H. eds. *National Online Meeting. Proceedings. New York, March 31-April 1, 1982*. Medford, N.J., Learned Information, 1983, pp. 495-505.

16. ROTHMAN, J. Telereference Services: Another Viewpoint, *Library Journal*, vol. 109 (1984) no. 7, pp. 789-790.

THE USE OF THE COMPUTER IN A COURSE OF INSTRUCTION FOR PHYSICAL SCIENCES STUDENTS

Priscilla A. Schlicke

Robert Gordon's Institute of Technology, Aberdeen, Scotland

Abstract

Computers can be used in a wide variety of ways in a course of library user education for first year students. These students have recently left school where, although they may have used micro-computers extensively, they had little, if any, experience of computers as tools for information handling. They must be taught not only that computers store information, both in bibliographic and full-text data bases, but how this information is retrieved when required by the user. This involves teaching basic search techniques and commands, truncation, principles of Boolean logic, online and offline printing and keyboard skills. Actual online searching using remote data bases via telecommunication lines is prohibitively expensive for a large first year class. Computer aided learning programs which run on micro-computers are all right for individual learning, but timetabling use for each student or even for several students via a network is an awesome task. Computer aided learning which runs on the Institute main frame and is accessed by local terminal is available in a very limited variety of forms.

The school of librarianship and Information Studies at RGIT has developed online catalogues for certain forms of library material, including newspaper cuttings and pamphlets. Each item has been keyworded, and the bibliographic details and the keywords entered into the data bases. The base is not only a catalogue of the collection but provides, as well, a facility by which online searches can be simulated at no real cost. Students can become familiar with some of the libraries' catalogues and with holdings, while at the same time gaining practical experience of online searching.

An often neglected area of use for the computer in library user education is the generation of course assessed work and exercises. If one lecturer or tutor-librarian is solely responsible for a user education programme, preparation of sufficient, individual, subject-based exercises for 65 or 70 or more students can be a difficult and time-consuming task. A data base of a bank of relevant questions can be prepared, and a program run to select questions randomly and to generate both exercise papers for the students and answer papers for the teacher. There is such a program at RGIT and several data bases for different subjects and different years have been created. Students are thus assessed individually on information sources and library use in relation to the particular subject they are studying.

It is of course essential to teach students the implications of computers in the online age and to be certain they understand how computers both store information and enable it to be retrieved. But it is also important to realise that computers can be a major, if less dramatic, source of practical help to the beleagured, often overworked, lecturer.

At a user education conference in Edinburgh last year, Maurice Line, the Director General of the British Library Lending Division, described one end of the wide range of user education literature as the severely domestic and practical - 'how I educated my users' - and the other as the purely conceptual.[1] This paper is concerned with the 'severely domestic and practical' - the home-grown solution to one particular problem of user education.

In common with other institutes of higher education in the United Kingdom who award degrees under the auspices of Council for National Academic Awards (CNAA), Robert Gordon's Institute of Technology in Aberdeen, Scotland, have incorporated modules on information sources or information studies into most of their degree courses. For the degree of BA in Physical Sciences, the information studies modules are taught in the first and third years. Students are introduced to scientific literature in its different forms, including abstracts, indexes, reviews, technical reports and on-line data bases, and given practical instruction on how to use our library, in the first year, while the third year, which has not yet been taught, aims to provide the students with a methodology for information gathering and organization. It is the responsibility of the staff of the School of Librarianship and Information Studies, rather than the staff of the Institute Library, to teach this course. I want this morning to describe the use we have made of computers, both in providing hands-on experience of on-line searching and in generating individual assessment and exercise papers, in teaching the first year introductory course.

Those involved in teaching information sources generally realise that it is not sufficient simply to describe in lectures the various information tools, such as handbooks, abstracts, library catalogues, which are available. It is essential that, as well as understanding the purpose of these tools, students are taught actually how to use them - are given hands-on experience of them. We felt very strongly that this hands-on experience was similarly desireable in teaching students about on-line information sources and on-line information retrieval. In the physical sciences course there were some sixty-five students and this in itself raised problems about how to demonstrate an on-line search effectively, and how to provide individual hands-on experience. We had recorded mediatron tapes of a search of Chemical Abstracts on Dialog, but this was unsuitable for such a large group, even with a big screen television monitor. We also had the CAI package 'Dialog on Pet' developed at the University of London, but this ran on a PET micro and only two of those machines were available, so this was obviously unsatisfactory as well. With so many first year students money for individual or even small group live, on-line searches was, not unnaturally, unavailable. We were thus left with the problem of how we might provide at least a simulation of an on-line search for each of the students to give them an idea of both the principles and the power of on-line searching.

We were extremely fortunate in having available an in-house search package called IRSINT with five in-house databases for interrogation:

ARPAM - 6500 pamphlets on architecture
OIL - 5400 newspaper cuttings on North Sea oil
DINDEX - 3000 newspaper cuttings on communication
DOFILE - 2500 newspaper cuttings on domestic science.
INFARM - 174 items on computers and pharmacy

These had been created about nine years ago and had served two distinct functions. They had provided an on-line catalogue to various collections of material in the library and they had been used to introduce on-line search methods to students of librarianship and information studies. Until this past year they had not been used for teaching on-line searching to students in other schools within the institute.

Although the IRSINT search package and the databases are obviously nowhere near as complex as a real on-line database, they do provide a surprisingly good range of search commands and techniques. On running the programme users are offered the following set of commands:

begin
define
display
expand
list
save
select
combine
delete
end
explain
print
search
set

The student can thus select the command he wishes and interrogate the data base accordingly. EXPAND hous, for example, will list the search terms or key words beginning with those four letters and allow the student to discover the search term used in the database for the subject housing. Using the command word DEFINE allows the student to name an author or a word in a title and then SEARCH the database to retrieve relevant information. Using key words discovered with EXPAND the student can select the appropriate terms and create sets of items which have been indexed with these key words. Selected sets can then be combined using the Boolean operators and, or and not to retrieve very specific or complex information in a way similar to commercial databases. The students in the physical sciences course searched the ARPAM database for information on the planning of housing in Scotland as follows:

1 Select housing (501)
2 Select Scotland (313)
3 Select planning (485)
4 Combine 1 and 2 and 3 (1)

They thus discovered for themselves the power of the on-line database to retrieve the one specific piece of information in the database which dealt with the particular topic 'planning of housing in Scotland.' To illustrate the importance of the logical operators the sets were also combined using the operator 'or' and the resulting set contained more than 1.000 items. This was a dramatic demonstration of the difference among the logical operators and emphasised to the students the importance of using the correct one. Another search was done on the OIL database for information on employment and taxation in the oil industry and again the sets, each containing a significant number of references were combined to retrieve very specific information. In addition to selecting and combining, the IRSINT program allows sets to be displayed, saved or deleted to alter the search, and references can be listed on-line on the VDU screen or printed on a line printer. After the students had completed these two searches they were given time to investigate the system for themselves, and they selected key words and created and combined sets to explore further the power and possibilities of on-line searching.

The IRSINT system is obviously extremely simple in comparison with commercially available databases. It is impossible to select more than one key word at a time, no stacking commands are available and only minimal bibliographic information is stored in the database. Nor are the databases, unfortunately, linked to the subject of physical sciences which the students are studying. But each student does have the opportunity of seeing for himself the power of on-line searching and comes away from the teaching session with a much clearer understanding of the priciples of on-line searching - of the importance of selecting the right search terms from the thesaurus and of combining the sets in a logically correct form. The Computer Services Unit within the Institute has provided rooms with about 25 computer terminals available for student use. With such a large number of terminals each student had the opportunity to do his own searching and to investigate other features of the databases and the interrogation system. In addition to learning about on-line searching, it was a chance to practice keyboarding, logging-on and -off and other computer skills. Students coming from secondary school increasingly have experience of using microcomputers, but they are usually not familiar with terminals linked to main frame computers, and they are almost never aware of the use made of computers for information studies. (But with several information skills research projects currently being undertaken this is likely, I hope, not to be the case in the future.)

IRSINT gave us the opportunity to give each student in a fairly large course a chance at searching on-line and was an extremely useful way to demonstrate on-line information retrieval to students at virtually no cost. I am quite certain that it is not only in the United Kingdom that the costs of equipment and teaching materials are a considerable factor in any course of instruction. Commercially available on-line instruction packages seem to abound in the literature, but on closer investigation too often appear to have disadvantages and drawbacks. Indeed, simply trying to find out what, if anything, relevant and suitable is available is frequently a problem. High costs, both of initial acquisition and of any necessary modifications, may make purchase of such schemes impossible, or at least very difficult to justify. Make-shift solutions to teaching problems are frequently more of a necessity than ever and it is important not to ignore or neglect tools already available which might prove highly successful when applied to new situations. Obviously we all have access to different machines and different programs, and we have different user education 'problems' to solve. But I would ask any of you not to neglect anything already available in your own back garden which might, with a little imagination, not only prove a solution to a problem, but a real bonus in your teaching.

But in addition to using 'technology to teach about itself', computers can be used to generate course assessed work and exercises in user education programmes. When the teaching is a formalised, structured part of a CNAA degree course student assessment is essential and indeed required. It can be a tremendous task to prepare individual assessment papers for each of 60 or 70 students in a class. And any teacher will know that one, or even three or four different papers is not an ideal, or even a satisfactory way, to measure library or information skills; nor is an essay answer on a formal examination enough. At RGIT we have developed a program which generates random tests and assessment papers for students, as well as answer papers for the teacher, from a data bank of questions prepared by the teacher. The questions in the physical sciences database include use of the various library catalogues, of abstracts and indexes, of handbooks, directories, dictionaries, standards and so on. Some questions are specific and practical -'what is the classification number for nuclear magnetic resonance?' - while others require more expository answers - 'what is the function of an abstracting service?' Some of the expository questions are common to all assessment papers, while the practical questions are unique; and, overall, each paper is individual, so there is no possibility of collusion among or between students. Preparing a databank of sufficient questions to ensure an adequately random sample is time consuming, but once set up the databank can be maintained with minimum effort. Depending on the database created, this system can be used for generating assessment materials for any subject. As well as assessing the student, the papers can also provide some sort of evaluation of the various parts of the information sources course. In my own case the answers on the purpose of an abstracting service were not all they should have been and indicated that rethinking some parts of the instruction for next year is essential. In the literature of user education much emphasis is placed on the importance of evaluating this education, while at the same time stressing the difficulty of doing this adequately; some form of assessment in formalised 'user education' is essential and indeed required. The computer is an ideal work horse, and any tool available which gives the teacher more time to think and actually to teach should be exploited fully. I would urge any of you who find yourself in the position of having to teach and assess such courses to investigate the possibility of using computers to help make this task of assessment both less tedious and time consuming, and more successful.

Reference

1. LINE, M.B. Thoughts of a non-user, non-educator. In: Fox, P. & Malley, I. eds. Third International Conference on User Education, University of Edinburgh, 12-22 July 1983. Loughborough, INFUSE Publications, 1983, pp. 2-9.

10 YEARS OF TURNING OUT ENGINEERS FOR USING SCIENTIFIC AND TECHNICAL INFORMATION AT THE COMPIÈGNE UNIVERSITY OF TECHNOLOGY

Liliane Vezier

Compiègne University of Technology, Compiègne, Cedex, France

Abstract

The Compiègne University of Technology (U.T.C.), like other French universities, has three main tasks: education, research, information and scientific and technical documentation.

Concerning the first task, the U.T.C. provides the initial education of engineers and the continuing education for engineers working in industrial concerns.

One of the purposes of the engineering education is to enable the students to adapt themselves, to use their basic knowledge, to acquire new skills, and to keep themselves informed of up-to-date scientific technical, economical and social evolutions: briefly, to enable them to inform themselves.

So, it appeared necessary that future engineers should acquire this ability, and practice the research and synthesis of information in the course of their studies. In the interest of efficiency, this acquisition of knowledge has been designed in such a way that it is integrated as far as possible into the engineering courses, particularly at times when the students can find this useful, thus enabling them to see the utility of using scientific and technical information in their professional life.

It is obvious that there are some elementary conditions: the arrangement and organization of a library, with user-friendly opening hours, with an extended and immediately available documentation, freely accessible, an efficient and easily usable catalogue, good means of sign posting the documents: to sum up, a documentary tool able to create conditions for promoting use. This could provide a base for the initial user education, where the aim is to teach the engineer-students how to use the library, its services, its collections, its resources and potential. This is achieved by the organization of visits every half-year for the new students, and "unités de valeur" of teaching that give them the opportunity to make a literature search and to write a synthetical report.

Furthermore, the user education programme is designed with this intention: every engineer that has been educated at U.T.C. must know of the existence of scientific and technical information, particularly in the form of databases, what kind of information he can extract from them, and when he must have recourse to them. During this education, that is always included in a "unité de valeur" of scientific teaching, the engineer-students will have the opportunity to use the reference books and the manual bibliographies, and also the databases. Sometimes, this teaching is extended two half-years later, this system allows the students to bring up-to-date their previous research and to use the databases once more. Finally, this education also forms a part within the framework of preparing for the doctoral degree.

It should be noted that this kind of education, which started at the Compiègne University of Technology in 1974, is becoming general in the French technical universities after activation and introductory actions in which U.T.C. has taken a very important part. Now, a new effort is taking place and is particularly centred on the information concerning industrial property and standards. Then again, the U.T.C. has tried to make practising profession engineers, and industrial managers aware of information resources by the following means:

- promotion and initiation during the period of instruction in permanent education,
- information and promotion actions to the Chambers of Commerce and Industry, from 1976-77 and then, with their assistance, to the management of industrial concerns,
- actions which are being perfected with the aid of the National Council of French Engineers and Regional Public Institution (Etablissement Public Régional) for all engineers working in industry in the region of Picardie.
  A similar action is being tried in the "Rhone-Alpes" region. The results of these experiments could be the bases for further actions in other regions of France.

That is why, since 1974, the U.T.C. has taught the engineering-students and afterwards the qualified working engineers the use of scientific and technical information: information immediately available in the library, (which is well developed) as well as information available through database handlers and systems, and networks, giving access to primary sources.

CHANGING THE FACE OF THE SUBJECT LIBRARIAN IN THE ONLINE AGE IN ACADEMIC LIBRARIES

Mark Shields

Leeds Polytechnic Library, Leeds, U.K.

Abstract

The paper will relate the more important developments in online information retrieval in the UK, low cost of equipment, increased access through British Telecom's Packet Switched System (PSS), the growing number of databases, especially in business and the social sciences, downloading and current awareness facilities, to the traditional role of the subject librarian in academic libraries. Emphasis will be placed on polytechnic libraries rather than those in universities. There will be a brief discussion of what are considered to be the main differences in the subject librarian's role in the two types of institution. In many polytechnics this role includes: course coordination and planning, liaison with teaching staff, internal and external contacts on subject work, periodical scanning, book selection and the production of current awareness services and perhaps most important of all, subject teaching. Some of the reasons why information work and teaching have been so little affected by online services are examined. Possible solutions are advanced which take into account greater computer literacy and subject sophistication amongst end users, changing structure of courses and a growing awareness of computer capabilities amongst subject librarians. The paper will conclude with an outline of the ways subject librarians can enhance their role as academic intermediaries by embracing some of the opportunities offered by online information retrieval.

The use of the word 'academic' in the title of this paper could be confusing for it suggests that academic libraries can be, or at least will be for the present purposes, treated as a unity. Whereas in fact academic libraries tend to reflect the objectives of their parent institutions and the needs of their particular users and these can be quite different between one institution and another. This paper will focus on those libraries in higher education in the United Kingdom that are organised along subject specialist lines and where subject teaching of the end-user is seen as an important part of the librarians duties. I shall make the suggestion that these libraries have made a considerable contribution to user education but that they have largely failed to harness the possibilities of online. There are a number of reasons for this failure but also reasons why this situation is likely to change and must change if the subject librarian is to maintain his role.

Some background information on the nature of the institutions these librarians work in will be useful so that we can see what sort of objectives the libraries have.

In the UK there exists a binary division between universities and other higher education institutions, most especially the polytechnics. The traditions, resources, staffing, student profile and other factors in the polytechnics are in many ways different from those in the universities. When the polytechnics were established it was intended that they should provide a different sort of education from that available in the universities. Students should be from a wider age and social range and there should be more work below degree level. Secondly, these institutions were seen primarily as teaching institutions and any research was to be of an applied rather than academic nature. Thirdly, courses were to be broad based and relate to social, economic and professional needs as well as to the needs of the individual. These courses were to be flexible and interdisciplinary and should not, as in most universities, be organised around a single academic subject.

Not all of these objectives have been realised but insofar as they became the goals of institutions they had an important impact on the educational structure and on the role and function of the library service. This service was often deemed to have an important part to play in the educational process. Libraries were organised around subject specialities that were not academic in the usual sense but matched the subjects taught in the institution. The purity of the subject was weakened but it was more relevant to the needs of staff and students.

In this situation the main objectives of the subject librarian are as follows:

Integrate academic courses and library activity
Provide for efficient use of the library by all users
Teach information sources and retrieval methods to students
Satisfy the information needs of all users.

Within these broad objectives librarians undertake a number of duties (this list is obviously not exhaustive):

i) Course coordination and planning
Liaison with teaching staff

ii) Stock selection
Literature searching
Periodical scanning
Production of current awareness service
Publication of lists and guides

iii) Reference duties
Subject teaching

The subject librarian then is concerned with both information work and teaching and it is the latter that makes his role distinct from that of the reference librarian. Looking at this list it would appear that the possibilities for online services to make a substantial contribution, especially in groups ii) and iii) are obvious. Yet the advent of online services has made only a limited impact on subject librarians and there are a number of important reasons why this has happened.

Factors limiting the use of online:

Perception of online use

Online services first made an impact in special libraries, multi-national companies, research centres and large university libraries that sustained a high level of research. Its rise in these areas gave rise to certain perceptions which continue to affect even those librarians not working in such organisations. It is assumed that online searches are only for sophisticated and specialised users - that it is for exceptional rather than for common usage. In many libraries this effectively prevents online being used for undergraduate or sub-degree level work. Secondly, since online services cost money it is assumed that there must be an identifiable return. In companies the return is profits and in universities it is research status - the currency of higher education. In libraries where these criteria do not exist there is still a tendency for them to influence the use of online.

Human factors

Some librarians have been unable to respond positively to the arrival of computers. This is particularly true of subject teaching librarians who may have been able to see the value of automation of the catalogue, issue system and even online services (in special cases) but have not been positive in using computers for their subject work. This situation is not helped by the technology-led rather than subject-led attitude to online services.

Cost

Online services make library managers cost conscious. Libraries that have confidently spent large sums of money over a period of years on books, journals, abstracts and indexes suddenly become vigilant about the relatively small amounts of money made available for online. Concerns about costs are twofold: firstly, because costs are explicit and easily seen they give rise to alarm. Secondly, these costs raise the spectre of charging the user and nearly all librarians are instinctively against this.

Irrelevant to the teaching function

A central objective of the subject librarian is to ensure that students leave the institution with a sound knowledge of information sources in their area of work and of the appropriate retrieval methods. The object is to give students a degree of self-reliance and independence when dealing with information. Online is seen to threaten this because the independence of the user is not seen to be achieved when he has to go through an intermediary.

This might be the end of the story, with online services continuing to play a peripheral part in the life of the subject librarian. However, there are a number of factors operating to bring the subject librarian and online closer together.

Factors promoting the use of online:

More databases/better access

It was mentioned earlier that many librarians perceived online as being of most relevance to specialised information demands. However, the growth in the number of databases, particularly in technology, business and company information and the social sciences is likely to persuade more subject librarians that online access is of greater importance than they had previously thought. This tendency will be increased as the number of interdisciplinary databases, and those aimed at practitioners rather than academics, grows.

Access to databases is also becoming better. Telecommunication networks are improving and developments with microcomputers and other intelligent terminals offer the possibility of reduced contact time, better search strategies and more assistance to the inexperienced searcher.

Professional development

Subject librarians will become increasingly aware that online services offer important enhancements to their role. This relates more to online provision than to other forms of library automation because the benefits are passed on and are immediately recognised by the user. Subject librarians owe their prestige and function to good communication with the user, so it makes sense both professionally and strategically to have the service you offer highly valued. The job enrichment and status that comes from being an information 'gatekeeper' in a subject should be easily recognised.

Cost effectiveness considerations

Few libraries in higher education have been able to avoid financial cuts over the past few years. In some institutions these cuts have been drastic and it is unlikely that the situation will improve in the near future. The implication for library managers is that they will have to review much more critically what their shrinking funds are to be spent on. This promises to be quite a traumatic experience for those libraries which have bought on the basis that a 'well stocked library' ought to have certain items. The model of the 'well stocked library' in higher education has been based on the universities. Polytechnics and colleges have different needs and when they come to implement financial cuts they may find it difficult to justify expenditure on sources which only have marginal relevance. Justification may be even more difficult if the source is available online. It is ironic that at a time of diminishing resources an impetus may be given to online services as library managers are forced to recognise hidden as well as overt costs.

User expectations

Over the next few years the end-user will be increasingly better placed to evaluate the information provision in academic libraries. In part this is because the attitude of users to information is being influenced by wider factors. Firstly, information has become a commodity and one that is not just available in libraries. The growth of information technology and the information industry has altered perceptions. It is assumed that information is not only more easily available but more easily manipulated. Secondly, library users now have a growing awareness of information technology. The home computer industry is booming and those children without a computer at home are almost certain to have access to one at school. Even those students in higher education at the moment have a high level of information technology in their courses and courses which do not adequately contain this component are subject to unfavourable review. Thirdly, libraries have played a part in altering user expectations by automating a range of their functions. Public access terminals allow users to interrogate the catalogue or their borrowing records and some may even have become aware of a facility for searching remote databases.

Redefined teaching role

One of the constraints on the use of online is that it appears to conflict with the aims of traditional subject teaching - how to reconcile end-user independence with an online intermediary. But the factors that have just been outlined make it necessary for subject librarians to reconsider their role. For how can a librarian claim to be teaching information sources and at the same time treat as peripheral the vast amount of information available online?

Two developments, both within the power of librarians to control, will be necessary if full advantage is to be gained from online. Firstly, teaching should be based less on the techniques of literature searching and more on information use and the analysis of information needs. Not only is this professionally more satisfying but it is educationally more valuable because it makes a useful contribution to the self-reliance of the user. Much subject teaching at the moment operates on a fundamental misunderstanding of the user's requirements and behaviour. Users are not too interested in the process of finding information but in the results. Furthermore, a number of studies have shown that when students become professionals their information behaviour is even more ends, rather than means, based. Secondly, the teaching of information retrieval techniques should include online. This does not, or rather need not, involve showing users how to perform searches but acquainting them with the advantages and disadvantages of online. It will be up to individual librarians to decide how best to do this but many library schools are now using video and computer-based simulations and emulations and these could be modified for other users. By integrating online in this way users will have an overall view of information sources and not one that is based on their medium of production.

One further important implication of these developments will be that subject librarians must be more prepared to act as information providers and not just as information instructors. This can be justified in relation to both the information needs of the end-user and the growing technical abilities of librarians skilled in online searching.

The following, then, is a brief summary of the more important characteristics of the subject teaching librarian's role in the online age:

i) Maintain 'traditional' aims and duties
ii) Provide a total and integrated service
iii) Expand the teaching role
iv) Develop expert knowledge of all information sources in the subject
v) Become a skilled online intermediary
vi) Exercise resource allocation within a subject field.

References

COWLEY, J. ed. *Libraries in higher education: the user approach to service*. London, Bingley, 1975. 163 p.

DALTON, M.S. The role of subject specialism in the future development of information services. *Journal of Information Science*, vol. 1 (1979) no. 2, pp. 107-112.

HARRIS, K.G.E. Subject specialisation in polytechnic libraries: aims and objectives. *Libri*, vol. 24 (1974) no. 4, pp. 302-309.

KENT, A. & GALVIN, T.J. eds. *The online revolution in libraries*. New York, Marcell Dekker, 1978.

EDUCATION AND TRAINING OF STUDENTS OF CIVIL ENGINEERING AS USERS OF SCIENTIFIC AND TECHNICAL INFORMATION IN THE CENTRAL TECHNICAL LIBRARY OF EDVARD KARDELJ UNIVERSITY IN LJUBLJANA

Nada Čučnik-Majcen and Mara Šlajpah

Central Technical Library of Edvard Kardelj University in Ljubljana, Yugoslavia

Abstract

The Central Technical Library at the Edvard Kardelj University of Ljubljana was one of the first libraries in Yugoslavia to begin, about ten years ago, to educate systematically students as users of scientific and technical information. Regarding the specific development of libraries and information-documentation centres, the latter have been privileged as regards the computerization (finances, equipment), whereas libraries are mostly not computerized; this fact must be taken into consideration in educational programs for users of scientific and technical information. It means that students must be taught how to search relevant scientific and technical information in classical library sources as well as in computer data bases. The co-report shows the program of education of students as users of scientific and technical information in the field of civil engineering during pre-diploma studies.

1. Introduction

The main purpose of the Central Technical Library (CTL) is to serve, through the media of scientific documents and scientific and technical information in the field of technical and natural sciences, users at the university, and in research institutes and industry. In the library information system of Slovenia, CTL plays the role of methodological, referral and interlibrary information centre, while in the Yugoslav scientific information system it is the host of the Specialized Information Centre (SIC) for civil engineering and for technical and natural sciences.[1]

Ten years ago CTL started the continuous education and training of students in the technical faculties in Ljubljana, but not until 1983 did the development of Specialized Information Centres (SIC), strongly related to the development of data bases, enable CTL to include on-line information retrieval in data bases in the program for the undergraduate students. There are 14 SIC in Slovenia, their data bases covering special fields. The members of SIC are working organisations having INDOK service with a library. The task of the Specialized Information Center is to coordinate the development of the collective data bases, which are formed by means of the scientific documents of SIC members (articles, dissertations, etc.) as well as the purchase of foreign data bases. The SIC host also performs computer processing as regards formation of data bases, SDI and retrospective information searching and mediates referral information.

The largest SIC is that for civil engineering (20 members): faculties of the two Slovene universities, research institutes and industrial organisations.[2] The automation of libraries and SIC has not been simultaneous. From 1970 onwards documentalists showed much more understanding of the need for automation, for which they acquired continuous financial support, whereas the libraries mostly continued to use manual information sources.[3] This fact must be taken into consideration when the programs of the combined courses of manual and computerized information retrieval are being prepared, at the CTL, for students.

2. The development of computerized information retrieval in Slovenia

The first computerized databases, produced in foreign information centres, were introduced to Yugoslavia in the form of batch processing of SDI services, just as in other countries, such as Australia, as follows:[4]

COMPENDEX (1973), CHEMICAL ABSTRACTS SEARCH (1979), INSPEC ABC (1977), ISMEC (1976), RSWB (1978). Some databases result from the cooperation between SIC and foreign information systems: CANCERNET, YU, INPADOC, AGRIS, ARTEMIS (management of information systems). Home made databases result from the cooperation among members of SIC:

INES (ecology of dangerous materials), KISIK (spectra) POLI (infra red spectra of compounds for surface protection), SAIDC-ST (mechanical engineering), SAIDC-EL (electrotechnics) SAIDC-TE (textile technology, ready-made clothes), SOCIOLOGIJA, POLITIČNE VEDE IN NOVINARSTVO, EKOSIC (economy and related sciences) SAIDC-GR (civil engineering), SAMOUPRAVLJANJE, ALKALOIDI, BIOMEDICINA SLOVENICA.

Six databases are devoted to mediate referral databases, mostly formed in separate libraries (union catalogues, guides to the libraries, etc.)

3. Computerized information retrieval in the field of civil engineering

The following databases in the field of civil engineering are available at the Republic Centre's CDC CYBER 172 computer:

- RSWB, database of civil engineering information, Federal Republic of Germany, covering 170,000 source items. Program DORS is used for processing databases for SDI and retrospective information retrieval.
- COMPENDEX - database of engineering information, USA, covering more than 1,000,000 source items (articles, conference papers) with a yearly growth of 100,000; 20 % source items in the field of civil engineering. The base is processed by DORS computer program for SDI.
- SAIDC-GR, system of automated information/documentation centres-civil engineering, Ljubljana, Yugoslavia, covering 4,000 source items (articles, books, dissertations, conference papers, standards) with a yearly growth of 6,000 since January 1984.

- RE - Union catalogue of serials in the field of technical and natural sciences in Slovene libraries, covering more than 16,000 source items of serials in 66 Slovene libraries. The union catalogue was computerized in 1975 by Intertrade Computer Centre's IBM/370-135 computer, but is not available for on-line searching. The union catalogue is printed, arranged alphabetically and classified according to the UDC (1975, 1979). In 1984 it was edited, not only in a printed form, but also in the form of microfiche.

4. Undergraduate course for the students of civil engineering

The starting point of the course program is the fact that the task of a library is to combine theoretical lectures on informatics/documentation with practical training in presenting the source of scientific information and demonstrating the searching of scientific information on a topic with the aid of reference books and on-line searching of scientific information.

The basis for the introductory course lecture is the UNISIST methodological manual.[5] The course consists of

1. an introductory course lecture at the Faculty of Architecture, Civil Engineering and Geodesy (2 hours) which can be lengthened for one or two hours in those cases where informatics is not regularly taught at the faculty. (50 students or more).
2. training (2 hours) for manual and on-line information searching on a topic, most frequently this is the theme of the diploma work, (groups of 5 or less students). The lecture deals with the reasons for the emergence of information science, its basis, construction and the method of searching scientific information by means of conventional and non-conventional sources.

The description of scientific information systems in Yugoslavia, the demonstration of SIC and its databases related to the students' studies and future occupation, formation of the user's profiles for SDI and retrospective information are added to the program. This program has not become a part of the regular students' program yet.

5. Training in manual and on-line searching

The student is introduced to the methods of a user of scientific and technical information who needs, before starting research, information about what has already been done on this topic, and then decides upon primary documents to be borrowed from a library. At first, the students search literature on a topic manually from various referral journals in the field of civil engineering (Concrete Abstracts, Engineering Monthly, etc.) and write down the result of the search. Secondly, the students try to find standards related to the theme of the investigation by means of catalogues. The students are also given the list of the standards as regards their studies and occupation.

The databases presented in section 3 serve for the demonstration of on-line searching on a topic of the student's own choice. The intermediary of the demonstration is an engineer (Bachelor's or Master's degree - civil engineering, architecture) with practice in his occupation as well as in an INDOK centre. This decision is not formal but is a demand due to the lack of terminals. The students receive an example of the formation of the SDI profile from RSWB database by means of a computer. The student is also given a computer record if he is working for his diploma thesis. On the basis of complete information about the literature on a topic, the student finds out if this literature is in the stock of CTL (with the aid of card catalogues, computerized union catalogues of serials, classical union catalogue of monographs) or in any other Slovene library; he is also taught that the CTL can mediate the loan of the literature from other Yugoslav libraries or abroad.

6. Methods and media used for teaching computerized information retrieval

are: lectures, on-line demonstrations, slides, profile preparation, computer records.

7. Evaluation

The evaluation of manual information searching is a written paper, evaluation of computerized IR is an informal discussion comparing both ways of searching, so far it has always been in favour of the latter. Evaluation of the students' knowledge is based on results of searching of the literature on a topic in the catalogues.

8. Future plans

Future plans include the acquirement of better equipment - terminals - so that the demonstration of a student's own search would also be possible; preparation of new media for teaching CIR (computerized information retrieval), manuals, brochures; and the inclusion of this program in the regular studies at the university.

References

1. ČUČNIK-MAJCEN, N. & ŠTURM, L. Koordinacija nabavke inostrane literature i medjubibliotečke pozajmice na području tehničkih i prirodnih nauka u SR Sloveniji: II. Jugoslovensko savjetovanje biblioteka Univerziteta u Jugoslaviji, Banja Luka, 6. i 7. oktobar 1983.

2. ŠLAJPAH, M. Sistem specialnih knjižnic v SR Sloveniji. - 10. skupščina Zveze društev bibliotekarjev Jugoslavije. - Opatija, 20.-30.3. 1984.

3. ŠLAJPAH, M. Supplying users with scientific and technical information and scientific documents (with special regard to the Socialist Republic of Slovenia). INSPEL: Official Organ of the Division of Special Libraries, vol. 17 (1983) no. 1, pp. 29-44.

4. FJÄLLBRANT, N. On-line education round the world: the use of on-line information retrieval in Australian institutes of higher education. IATUL Proceedings, vol. 12 (1982); 19-26.

5. EVANS, A.J. & RHODES & KEENAN: Education and training of user of scientific and technical information: UNISIST guide for teachers. Paris, UNESCO, 1977. 143 p.

STRATEGIES FOR USER EDUCATION FOR GRADUATE STUDENTS

Carole Duffill

Western Australian Institute of Technology, South Bentley, Western Australia

Abstract

WAIT library has a large user education programme whose graduate component has been increasing over the last few years as WAIT, like many other Australian tertiary institutions, has expanded.

The range and requirements for each course and the background of the students, many of whom hold professional jobs, and are studying part time, is very varied. To meet these demands the library has developed a range of user education programmes, all of which are integrated in the courses and given by library staff in the students' course time. Sessions range from one, two-hour class, to six, three-hour classes. Group sizes vary from 5 to 25. In some instances the library component involves the students in practical work designed to support their course work and provide the skills and methodology for research. In others it is purely conceptual and they are shown a range of possible useful sources, and have the opportunity to seek help for their research projects and theses on an individual basis later, when a reference staff member can be assigned to any interested student to act as a library 'consultant' and provide an initial subject source list.

The programme makes use of a range of teaching techniques and audio-visual aids and sample searches are also performed online for smaller groups when this is considered appropriate. The library component of each course is still being refined in response to students' needs and new user education programmes are being developed as new requests are received from teaching staff.

The library staff have learned to interchange teaching modules, techniques and resources between programmes, where possible, yet retain an individual subject approach for each course. This has proved a saving in preparation time and cost as well as making staff feel more competent in tackling a range of courses.

Some difficulties which had to be tackled, were recognised from the start e.g. the students' different levels of library sophistication, others emerged as the programmes were run and seen to be less effective than hoped. (A student opinion questionnaire was administered to some groups.) It has proved essential to develop an individual lesson plan for each course and to specifying whether the session aims at developing practical skills or introducing new concepts and an understanding of the literature or both. Initially this was not always clearly differentiated resulting in a mixed and often unsatisfactory session where neither was adequately achieved. It has also proved important to ensure that students are prepared for their library sessions and understand their purpose as well as ensuring that academic teaching staff are committed to it and able to provide a clear statement of their expectations of the outcomes from the session.

Western Australian Institute of Technology - WAIT - Library has a large user education programme (see Table 1) whose graduate component has been increasing over the last few years as WAIT, like many other Australian tertiary institutions, has expanded.

Table 1

USER EDUCATION AND ORIENTATION 1983

COURSE TYPE	TOTAL NO OF COURSES	TOTAL NO OF STUDENTS
UNDERGRADUATE	60	2,482
GRADUATE	12	257
ORIENTATION	7	575
OTHER COURSES	5	127
TOTAL	85	3,441

The graduate user education programme has been built on the methods used and experiences gained in teaching undergraduates. It has been altered and expanded to meet the more sophisticated needs of graduate students and to accommodate their varied backgrounds and the differences in their familiarity with literature searching sources and techniques.

User education sessions at WAIT are given only in normal class time in place of set seminars, lectures or tutorials. At undergraduate level, work done in the library component is often counted towards students' assessment, at graduate level this is not usually the case.

A major difference between the courses developed for graduate students and those run for undergraduates, is the inclusion of a segment on online searching in almost all the graduate courses. This is done so, either at the request of the teaching staff, or because the reference librarians consider it to be relevant to the needs of a particular group and feel that some students at least, will utilize the service.

WAIT Library has access to six online systems AUSINET, (an Australian system) DIALOG, ORBIT, ESA/IRS, BRS and MEDLINE and offers students the choice of either a rapid or a comprehensive literature search on these systems. Computer searches are all charged for on a cost basis. However in the case of student searches, these charges are subsidized by the library.

To prepare and demonstrate a search costs money, both in labour and online time. We have long since come to the view that user education sessions should be conducted on the students' "need to know" basis and that anything beyond this, no matter how valuable we as librarians may perceive it to be, is really superfluous. Such information is not remembered, it can detract from the main emphasis of the session and can even build up resentment against the instructor because of a feeling of information overload on the part of the recipients.

To decide whether to include an online segment in a user education session, library staff need to assess how likely it is that the students will make use of the service. This is really asking three questions.

- Is there a suitable data base in their subject field?
- Do the students have an assignment or other work which requires a comprehensive literature search?
- Will they, or their department, be prepared to pay for the service?

The first question is readily ascertainable by the librarian taking the session. No appropriate online data base, means no online segment in the course.

The teaching staff provide the answer to the second question. If students are required to review work in a particular area or produce a major assignment or experimental study which assumes a comprehensive literature search, and this forms a significant part of their assessment for that unit, then an online segment would almost certainly be included.

The third question is perhaps really related to the second. A willingness to pay for a search is in part an indication of how much the information is sought, how difficult it is to obtain, and how long this would take, balanced against the cost of paying to search for it online. WAIT, like most other Australian tertiary education institutions has a high proportion of part-time students (see Table 2). At graduate level, the majority of students would be studying part-time, while working full-time. This generally means that they are highly motivated, want to make the most effective use of their study time (which rarely seems adequate) and have the money to pay for an online search. Unlike full-time students the major obstacle to study which they encounter is lack of time, not money!

Table 2

WAIT STUDENT ENROLMENTS 1983	
FULL TIME	5,678
PART TIME	5,254
EXTERNAL	1,330
TOTAL	12,262

Besides assessing the usefulness of an online segment in the user education session, the library course co-ordinator ascertains what the lecturer expects the students to get from the session, when it is to be run, the numbers involved and the students' background, as well as negotiating for adequate time for the course and arranging any preliminary details such as topics to be covered or library handouts.

An individual lesson plan for each course is then developed. (Refer Appendix 1) This specifies the course aims and expected outcomes, outlines what is to be covered, how this is to be done and lists any necessary teaching aids. This approach was adopted as it has been used successfully for a number of years with the undergraduate programme. It provides a record of what is done, ensures that everyone involved in teaching the course has all the essential information and that the course is well organised.

For these reasons considerable planning has gone into the development of our on-line searching modules and, as new courses arise, library staff now have a number of patterns to work from in organising such sessions. These are not meant to stifle initiative in developing new ways of teaching, or in improving the effectiveness of the existing methods and materials (in fact all our courses are continually being modified and updated) but to make the best use of the combined experience of the group and to lessen class preparation time.

When sessions were first run for graduate students it was a combination of this methodical approach to developing user education courses plus the experience of teaching the graduates that made us realize that we had not really decided whether we were aiming to teach specific skills or to introduce, or to extend, the students' understanding of literature searching techniques, and to make them aware of what reference sources were available to them. Some of our sessions seemed to be aiming to achieve both purposes without allowing adequate time to do so. In fact we were extending the content of undergraduate courses because we felt that it was essential that students were familiar with library catalogues and indexing/abstracting journals and had basic manual searching skills before they could be introduced to more sophisticated research techniques and have an understanding of the structure of the literature of a particular subject. We soon decided that this approach did not work in the time allotted and that it was not really necessary. Many graduate students wanted to know only what reference sources were available to them, how, and in what order they should be tackled to search for information, and from whom they could seek help if needed. They often did not need the detailed explanation of these sources that the undergraduates required in order to use them.

Once this was recognized, a number of alternative techniques, which included demonstrating online searching, were devised for conducting the classes. This resulted in the development of course components which could be fairly easily modified to make them subject specific.

Where the major aim is to make students aware of the concept of literature searching or of extending their concept this is generally done in one 2 or 3 hour session to a group of not more than thirty students. The whole session is conducted in one teaching room. The online segment forms the last part of the programme which has included a variety of instructional media and methods. Students are shown a video cassette on computerized information retrieval produced by the Hatfield Polytechnic Library to give them an idea of what is involved in a computer search. This is followed by a discussion of how the system operates at WAIT. They then receive the results of a sample search which has been conducted in their subject area plus a copy, appropriately annotated, of the search request forms. This generally promotes an interest in and an understanding of the advantages there are for them in having an online search conducted, as well as reinforcing the importance to them of preceding any such search with a preliminary manual one so that they may become familiar with useful searching terminology and have a good idea of their search parameters.

Where smaller groups are concerned, or if the time given for the sessions is extended and a large group can be subdivided, a similar approach is adopted. In this case, however, the sample search is run online in place of the video to give students first hand experience of what is involved. The session then follows the pattern previously described.

Students who have had little or no previous practical experience in literature searching, and who may experience difficulty in using the items they have been introduced to in a library session, or indeed in deciding where to start searching, can seek help from the Information Desk staff or take advantage of the Research Projects and Theses Library Advisory Service run by the reference staff. This is an individual service which provides a student with a list of appropriate source material for his topic and any additional useful information. An appointment is made with a member of the reference staff who reviews the list with the student, ensures that he is able to use all the items listed and is generally available as an advisor for any subsequent problems.

Some courses include teaching specific manual searching skills as well as the ability to profile an online search. At WAIT all searching is still done by library staff and it is not expected that this will change within the next few years.

Some graduate students will be, or may currently be working in situations where they have direct access to online searching facilities, or where they can ask for searches to have conducted, but cannot be present at the time. These people need to know how to develop an effective profile to retrieve the information they want and to be aware of the range of data bases available to them. In some cases a few may subsequently become online searchers. Such students are not taught the techniques of operating a particular data base, but rather how to express their needs clearly in order to relay them successfully to the trained searcher.

These courses require more than one session. Typically students will have a preliminary session or sessions which includes an introduction to or reminder of appropriate indexing/-abstracting services, and in which they are given some practice in searching them under the tutelage of library staff. This section of the course is then followed by an introduction to the concept of online searching and a fairly detailed examination of how to develop an appropriate subject profile for specific data bases. Students are then required to do this before their next session.

Although the preliminary session/s may be conducted for groups of up to 30 at once, the next component assumes a group size of not more than 8 students. In this session a sample search is run online for the students in their subject area and some may be given the opportunity to have part at least, of their searches conducted. After this the usual handouts are given followed by a general discussion on any points which have arisen from the search and the profiling. Students then have the opportunity to arrange for a search to be done, based on their profile, at a later date. Where students are involved in profiling their own searches it has been found necessary in the chemical sciences area to have library staff who have some subject expertise in the field as well as online searching skills.

The online searching component is only one aspect of the user education programme with graduate students. It is being refined and altered and as the group's experience with graduate students extends, along with the pool of teaching resources, new courses can now be developed much more quickly than when the graduate programme first began. We intend to produce our own video on computer searching and are looking at ways to improve the effectiveness and quality of our teaching and handouts.

The feedback that we have had so far suggests that the courses are rated highly by those participating in them. We have run a number of formal student opinion questionnaires which have been very supportive, as well as receiving other positive feedback in verbal and written form from both staff and students involved in the sessions.

APPENDIX 1

HEALTH RESEARCH METHODS 581

LIBRARY INSTRUCTION - FIRST SEMESTER 1983

Academic level - Postgraduate

Sessions 1 x 2 hr.

Course co-ordinator - (academic) - Alan Stewart

Times - Wednesday 16.3.83 5.30 - 7.30 pm.

Introduction

- Students in this course have a wide variety of backgrounds and interests. The 2yr (part-time) Graduate Diploma in Health Sciences offers course streams in education, health administration, health research and evaluation, and advanced specializations (e.g. audiology, cardiopulmonary rehabilitation, developmental paediatrics, environmental health, gerontology, mental health, neuroscience, ...etc.)
- Many of the students are WAIT academics; others are practicing health professionals. Their knowledge of the health science literature and of library techniques was found to vary widely last year.
- In an effort to ensure that all students will be at least familiar with the Robertson library, its services, and the basic skills necessary to locate specific documents, they have been provided with relevant handouts 2 weeks prior to this session (see attached).
- Students should also have defined their literature search topic before attending this class.

Aims

- To briefly review the structure of literature in the health sciences, and the steps in a literature search.
- To discuss in more detail the computer literature search as part of the search process, and student access to this service.

Session format:

Introduction

* Meet students on level 3 and take them to the appropriate room. Introduce yourself, explain the purpose of the session and outline the content.

Structure of literature

* Hand out the green 'Structure of Literature' sheet, and briefly explain.
* For future reference, hand out 'Indexing journals for the Health Sciences' and run through briefly, showing examples.

Literature search steps

- Hand out the sample 'topic' for a literature search (SMON/Enterovioform). Ask students how they would tackle this problem (ie. how they would structure their search).

- After discussion, hand out 'Summary of search steps.' Run through in view of the discussion.

- Illustrate the procedure with the SMON example.

Computer search

- Sum up the results of the manual search on SMON so far:

  (1) Have defined the topic and formed a vocabulary of keywords.
  (2) Read introductory articles on the topic.
  (3) Looked for relevant books in the library catalogue.
  (4) Looked for references to other bibliographies on the subject.
  (5) Looked for review articles.
  (6) Searched relevant abstracts and indexes for references to journal articles.

- Suggest that at this stage, to save time and increase coverage of a literature search, students consider a computer search.

- Show video on online searching.

- Show the computer search pamphlet and discuss:

  - Principles of a computer search.
  - Comparison with a manual search.
  - Type of search available: rapid, comprehensive, current awareness.
  - Databases available through Ausinet, Lockeed Dialog, Orbit, Medline.
  - Costs.
  - Request procedure.
  - Filling in a request form properly.

- Hand out SMON search request for (blue) and photocopy of Medline search. Discuss search procedure and results. Remind students of the elements of the reference citation, and mention where to find the full titles of Journals indexed. To find the actual articles - refer to Joint Serials Catalogue or request ILL.

Handouts:

Structure of literature (green)
Indexing journals for health sciences
SMON Literature search topic
Summary of literature search steps
SMON manual literature search
SMON computer search request form (blue)
SMON computer search results

Material:

Copies of health sciences indexing journals
Computer searching pamphlet

THE ROLE OF NUMERICAL DATABASES FOR USERS

Heinrich Behrens

Fachinformationszentrum Energie, Physik, Mathematik GmbH,
Karlsruhe, Federal Republic of Germany

Abstract

The compilation of numerical data has a long tradition, but only, however, as far as handbooks and other versions in printed form are concerned. In that context the rapid development of computer technology during the last 25 years has now led to the establishment of numerical data banks in computerized form. The coverage of the different fields by existing numerical data banks is, however, even today, not as complete as the coverage by the existing handbooks. Nevertheless, a certain number of such numerical data banks now-a-days exists. Some examples for such data banks are discussed in the presentation, examples, which have been taken out of the fields of physics and energy. The overall situation for physics, concerning coverage and variation, will be considered too, in order to elucidate our relative position today. Some outlooks on other fields will also be given. Special emphasis will be directed to the question of how to use these data banks, i.e. points like compatibility of different data banks, difficulties because of their different retrieval languages, etc.

1. Introduction

The role of numerical databases for users covers a wide field. Therefore, let me make some introductory remarks as to where we stand today, and as to why there is an urge to establish numerical databanks now.

First of all, we have the flood of primary literature: for example, we have about 500.000 publications per year in chemistry and about 130.000 publications per year in physics as compared to 1920, when there were about 20.000 publications in chemistry and about 5000 in physics. It is also a fact that the number of journals has increased in the last hundred years more or less exponentially; the same holds true for the number of abstract journals, which are now available in machine-readable form in most cases, and also for the number of review journals. Unfortunately, the latter only cover a very small amount of primary articles.

Another point which should perhaps be mentioned is that data in physics, chemistry and the engineering sciences are mostly independent of time and location, with the consequence that the data are reproducible and their accuracy can be improved by repeating measurements over again. This situation is different in other fields of natural sciences like, for instance, astronomy and geophysics and completely different again in the field of economic and business data. I do not, however, have the intention of discussing the latter in detail, and will restrict myself to the situation in physics and borderline fields.

Corresponding data have been compiled for a long time in handbooks. In physics we have, for example, the famous Landolt-Börnstein Handbook. Apart from the flood of literature we also have to cope with a flood of data. This is illustrated by the example of the handbook just mentioned. The first issue of the handbook was published in 1883 in one volume. Today, we have more than a hundred volumes, and if we consider the number of pages, we have an increase by a factor of about 260. The coverage of the whole field of physics by this handbook is, on the other hand, no longer as complete as it was 100 years ago. Today the situation in physics is characterized by a large number of data compilations published in various forms, i.e. in books, journal articles, reports etc. The total number is about 3.800. The distribution over the different subfields in physics is shown in Table 1.

Table 1.

Distribution of data compilations (total number about 3800) and of the primary literature (according to Physics Briefs and to the year 1983) among the different subfields of physics.

	Data Compilations	Primary Literature Sources
General	15,9 %	8,5 %
Physics of Elementary Particles and Fields	2,3 %	4,6 %
Nuclear Physics	22,8 %	7,8 %
Atomic and Molecular Physics	21,4 %	7,2 %
Classical Fields of Phenomenology and their Applications	2,8 %	10,2 %
Fluids, Plasmas and Electric Discharges	4,2 %	5,4 %
Condensed Matter	18,4 %	31,1 %
Material Science	4,3 %	5,2 %
Physical Chemistry	7,9 %	4,1 %
Geophysics, Astronomy and Astrophysics	-	10,7 %
Cross-Disciplinary Physics	-	5,2 %

In addition, we also have a very limited number (ca. 60) of machine-readable databases in physics.

2. Types of data to be stored

Before I consider the machine-readable databases in detail, let me come back to the point as to what kinds of data should be stored in such a database. This is not as simple at it looks at a first glance. The data we have to consider usually look like this:

1. Measured Value
2. Uncertainty
3. Units (Si)
4. Data Type
5. Range of Validity
6. Method of Measurement
7. Combination with other Quantities
8. Bibliographic Citations
9. Comments etc.

However, as I have already mentioned, we often have more than one experimental result for one physical quantity. Sometimes these are even in contradiction to one another. It is therefore very important to know what to do when these data are stored in machine-readable form. Generally, it is now customary to distinguish between different forms of data handling and presentation. These can be described as follows:

Tabular Lists:	These are simple systematic lists of numerical information.
Data Compilations:	These are systematic collections of numerical data, with some re-organisation for an optimal presentation.
Evaluations:	These are collections of numerical data, but with just one recommended best value for one measured quantity. This recommended best value is derived by a critical consideration of available information.

It is obvious that the last form of "evaluations" is of major importance if we are considering storage of data in machine-readable form. But we should not forget that the evaluation procedure is very costly. This is one of the main reasons why the number of machine-readable databases is not as large as one might suppose from the statements we read in the newspaper every day, namely that we are living in the "computer age".

3. Machine-Readable Databases

First of all, let us now have a look at the overall situation concerning numerical databases which are now offered online. This situation is shown in Table 2.

Table 2

Database distribution among disciplines

(according to S.V. Meschel, Online Review 8 (1984),77)

Discipline	Numeric	Referral	Full text	Bibliographic
Physical Sciences and Technology (Includes Biology, and Geology)	78	24	–	154
Social Sciences Education and Humanities	21	16	–	96
Business, Economics Law	328	26	76	61
Multi Disciplinary	–	41	–	–
Total	427	107	76	331

By looking at this table, we see that a total of about 940 databases are offered online today, of which about 430 are of a numeric type. However, the great majority of these are in the fields of business, economics, law and social sciences. The number of databases in the physical sciences and technology, on the other hand, is much more limited. Let us consider the scene in physics and borderline fields, such as materials science, physical chemistry and chemistry in more detail. For this please refer to Table 3.

Table 3

SURVEY OF CURRENTLY WORLD WIDE EXISTING MACHINE-READABLE DATABASES IN THE FIELD OF PHYSICS (except Astronomy)

A. Particle Physics

Particle Properties Data Base (Berkeley, USA)
Particle Data Group Data Base (Durham, UK)
High Energy Reaction Data Base (CERN, Switzerland)
Compas Group Data Base (Serpukhov, USSR)

B. Nuclear Physics (except neutron physics)

ENSDF, Evaluated Nuclear Structure Data File (Int. Cooperat.)
Atomic Mass File (Kernphysisch Onderzoek, Amsterdam)
Gamma-Ray Catalog (Marburg Univ.)

C. Neutron Physics

Exfor Library (Int. Cooperat.)
Ecxil Library (LLNL)
ENDF/B, Evaluated Nuclear Data File (CSEWG, USA)
UKNDL, United Kingdom Nuclear Data Library (UKAEA)
KEDAK, Kerndatenbank Karlsruhe (KFK)
ENDL, Lawrence Livermore Laboratory Evaluated Neutron Data Library (LLNL, USA)
JENDL, Japanese Evaluated Nuclear Data Library (JNDC and JAERI)
JEF, Joint Evaluated File (Int. Cooperat.)
Socrator Library (USSR)
RCN-2 (3) Fission Product Cross Section Library (ECN Petten)
JNDC Nuclear Data Library of Fission Products (JAERI)

D. Atomic and Molecular Physics

Mass Spectra Data Base (NBS, NIH, EPA, MSDC)
Carbon-13 NMR-Spectra (FIZ, BASF)
Carbon-13 NMR-Spectra (CIS)
Carbon-13 NMR-Spectra (DARC)
Mössbauer-Effect Data File (University of North Carolina)
Gaphyor (CNRS-Pascal)
EPSTAR (NBS)
Infrared Spectra (Sadtler)
Infrared Spectra (Spir. CISTI)
IRSS, Infrared Spectra (CIS)
Evaluated Gamma Data Library (EGDL)
Atomic and Molecular Data Base (Belfast)
XGAM (NBS)

E. Crystallography

Cambridge Crystallographic Data Files (Cambridge Univ.)
Inorganic Crystal Structure Data Base (Bonn Univ. and FIZ)
Crystal Data Identification File (NBS)
Metal Data File (NRCC Canada)
Powder Diffraction (JCPDS)

F. Solid Stata Physics and Materials

EMIS, Electronic Materials Information Service (INSPEC)
MIDAS, Metals Information Data File on Alloys and Specifications (Metadex)
Cindas Numerical Data Bank (Purdue Univ.)
Materials Properties and System Analysis for New Energy Systems (LLL)
Materials Data Base for Energy Application (Tokyo Univ.)
Physical and Chemical Properties Data Bank (LLL)
Manlabs-NPL Materials Data Bank
Cutting Data (Infos RWTH Aachen)
Steel-Iron Data Bank (VDEH)

G. Thermodynamics

Facility for the Analysis of Chemical Thermodynamics (Ecole Polytechnique and Mc Gill Univ.)
THERDAS (RWTH Aachen)
THERMODATA
EROICA (University of Tokyo)
JANAF Thermochemical Tapes
Dechema Thermophysical Properties Data Bank (Dechema)
Physical Properties Data System (Instit. of Chem. Engineers)
Chemical Thermodynamics Data Base (NBS)
Thermophysical Properties of Helium (NBS)
Thermophysical Properties of Hydrocarbon Mixtures (NBS)
AQUA (Instit. of Chem. Engineers)
CHEMTRAN (Chem. Share Corp.)

Here, however, I would like to point out that only major machine-readable databases are listed. In contrast to table 2, where the figures presented are only those of databases offered online, table 3 mentions some databases which are not offered online, but are nevertheless available to the public and serve mainly as a basis for further complex calculations. By considering table 3, it is also immediately evident that the coverage of the whole field of physics by existing databases is very uneven. For example, the field of elementary particles and nuclear physics is covered much better than the field of solid state physics. In the wide field of solid state physics, on the other hand, there are hardly any databases. Those that exist contain mostly materials data and strictly speaking are not directly in the field of solid state physics. The only exception is the field of crystallography, where we now have perfect coverage by databases which contain the relevant data of crystal structures (atomic coordinates). In nuclear physics, as I have mentioned before, and especially in neutron physics, we have good coverage with the existing databases of evaluated data having the longest tradition.

4. Retrieval

At first glance, one could imagine that numerical databases were originally established for special retrieval purposes, e.g. special values etc. In fact, however, this was not the major goal of database establishment. Mostly numerical databases have been created

- for search and retrieval purposes of data
- as a basis for extensive calculations with direct access to the required data
- as a basis for the preparation of suitable printed versions with only the printed versions used in general.

The second point, for example, is the most important application in the case of the above-mentioned neutron databases. Changes occur so that databases originally prepared for one purpose are used for other applications later on.

In those cases where retrieval plays a major role the following examples could elucidate the situation for the above-mentioned physics databases

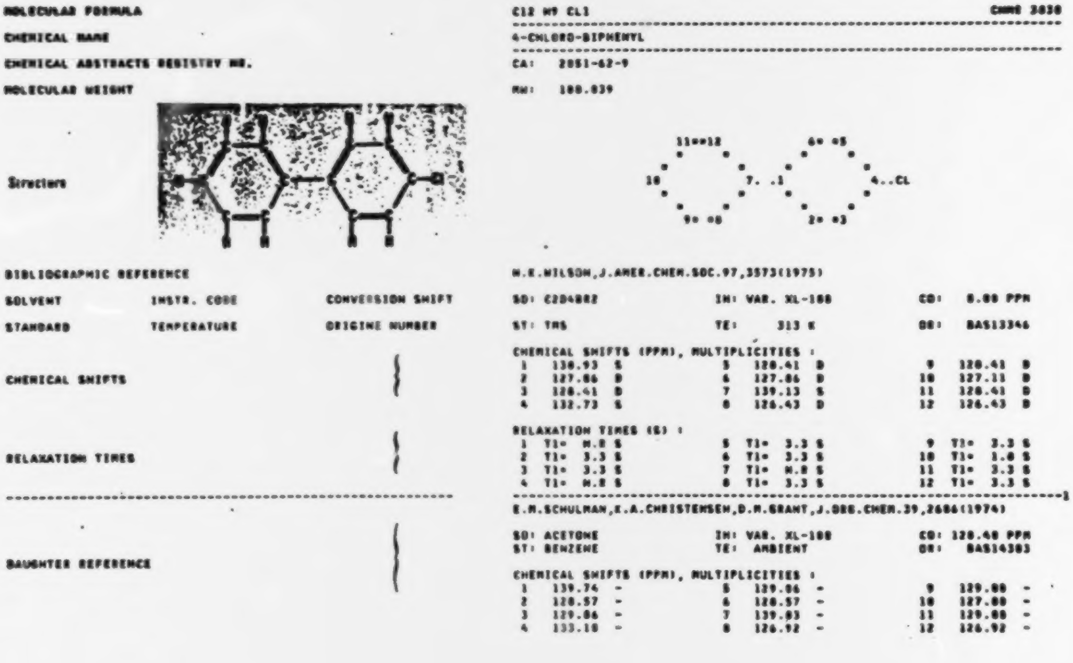
- retrieval of fundamental properties of matter
- retrieval of typical data like cross sections etc.
- structure elucidation
- identification of unknown substances
- locating the spectra of known isotopes or compounds
- analysis of mixtures by spectra matching
- determination of pollutants in air and water.

In many cases it makes no sense to retrieve large tables with numerous numbers. The reason is that the results are not easy to survey. In such a situation a graphical representation of the data is more useful, as the user can then overlook the essential points much faster. Examples are crystallographic data or neutron cross sections in the resonance region.

5. Examples

Now I would like to discuss two numerical databases in greater detail, in order to illustrate the retrieval procedure and also to show a little of the contents.

The first database which I would like to consider in this context is the C 13 NMR database (Carbon 13 Nuclear Magnetic Resonance). This database is produced by BASF and offered online by the Fachinformationszentrum. The database itself contains 53.000 NMR spectra of about 40.000 reference compounds. Figure 1 shows one data set from the master file (right side). On the left hand of Figure 1 you will find an explanation of the different quantities contained in the database. Of course the main information is contained in the numbers of the chemical shifts, the corresponding multiplicities, and the encoded chemical structure of the compound.



```
MOLECULAR FORMULA
CHEMICAL NAME
CHEMICAL ABSTRACTS REGISTRY NO.
MOLECULAR WEIGHT

Structure

BIBLIOGRAPHIC REFERENCE
SOLVENT            INSTR. CODE        CONVERSION SHIFT
STANDARD           TEMPERATURE        ORIGINE NUMBER

CHEMICAL SHIFTS                       }

RELAXATION TIMES                      }
-----------------------------------------------------

DAUGHTER REFERENCE                    }
```

```
C12 H9 CL1                                                    CNMR 3030
------------------------------------------------------------------------
4-CHLORO-BIPHENYL
------------------------------------------------------------------------
CA:   2051-62-9

MW:   188.039

                11**12          6* *5
               *      *        *     *
              *        *      *       *
            10          7. .1          4..CL
              *        *      *       *
               *      *        *     *
                9* *8           2* *3

W.E.WILSON,J.AMER.CHEM.SOC.97,3573(1975)

SO: C2D4BR2               IN: VAR. XL-100             CO:    0.00 PPM

ST: TMS                   TE:     313 K               OR:    BAS13346

CHEMICAL SHIFTS (PPM), MULTIPLICITIES :
 1   138.93  S             5   128.41  D              9   128.41  D
 2   127.06  D             6   127.06  D             10   127.11  D
 3   128.41  D             7   139.13  S             11   128.41  D
 4   132.73  S             8   126.43  D             12   126.43  D

RELAXATION TIMES (S) :
 1  T1=  N.B S             5  T1=  3.3 S              9  T1=  3.3 S
 2  T1=  3.3 S             6  T1=  3.3 S             10  T1=  1.8 S
 3  T1=  3.3 S             7  T1=  N.B S             11  T1=  3.3 S
 4  T1=  N.B S             8  T1=  3.3 S             12  T1=  3.3 S
------------------------------------------------------------------------1
E.M.SCHULMAN,K.A.CHRISTENSEN,D.M.GRANT,J.ORG.CHEM.39,2686(1974)

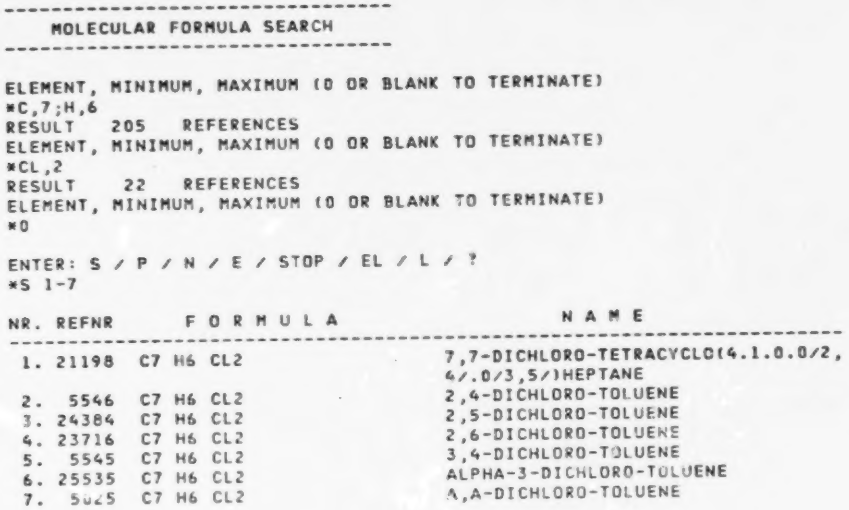
SO: ACETONE               IN: VAR. XL-100             CO: 128.40 PPM
ST: BENZENE               TE:  AMBIENT                OR:    BAS14303

CHEMICAL SHIFTS (PPM), MULTIPLICITIES :
 1   139.76  -             5   129.06  -              9   129.00  -
 2   128.57  -             6   128.57  -             10   127.00  -
 3   129.06  -             7   139.93  -             11   129.00  -
 4   133.10  -             8   126.92  -             12   126.92  -
```

Figure 1

BEST COPY AVAILABLE

In addition, some further information is given, e.g., on chemical formulas, molecular weight, reference etc. What can we now do with such a database? It is clear that we can make both simple and sophisticated searches as desired. An example of a simple search is a formula or name search. In the formula search, reference compounds and their spectra can be searched by specifying elements which should be present or absent. For such a formula search see Figure 2.



```
---------------------------------
    MOLECULAR FORMULA SEARCH
---------------------------------

ELEMENT, MINIMUM, MAXIMUM (0 OR BLANK TO TERMINATE)
*C,7;H,6
RESULT   205   REFERENCES
ELEMENT, MINIMUM, MAXIMUM (0 OR BLANK TO TERMINATE)
*CL,2
RESULT    22   REFERENCES
ELEMENT, MINIMUM, MAXIMUM (0 OR BLANK TO TERMINATE)
*0

ENTER: S / P / N / E / STOP / EL / L / ?
*S 1-7

NR. REFNR      F O R M U L A                     N A M E
---------------------------------------------------------------------
 1. 21198  C7 H6 CL2                  7,7-DICHLORO-TETRACYCLO(4.1.0.0/2,
                                      4/.0/3,5/)HEPTANE
 2.  5546  C7 H6 CL2                  2,4-DICHLORO-TOLUENE
 3. 24384  C7 H6 CL2                  2,5-DICHLORO-TOLUENE
 4. 23716  C7 H6 CL2                  2,6-DICHLORO-TOLUENE
 5.  5545  C7 H6 CL2                  3,4-DICHLORO-TOLUENE
 6. 25535  C7 H6 CL2                  ALPHA-3-DICHLORO-TOLUENE
 7.  5025  C7 H6 CL2                  A,A-DICHLORO-TOLUENE
```

Figure 2

This search strategy is not very different from a search in a bibliographic database and therefore perhaps not very interesting to you.

A more important problem where the database can very suitably be applied is the interpretation of an unknown measured spectrum. For an example of such a measurement see Figure 3.

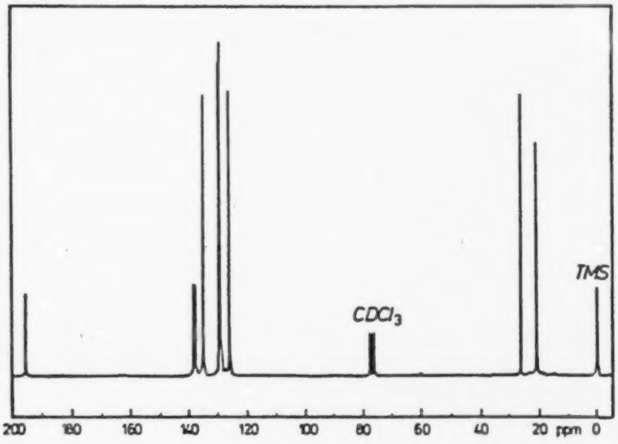
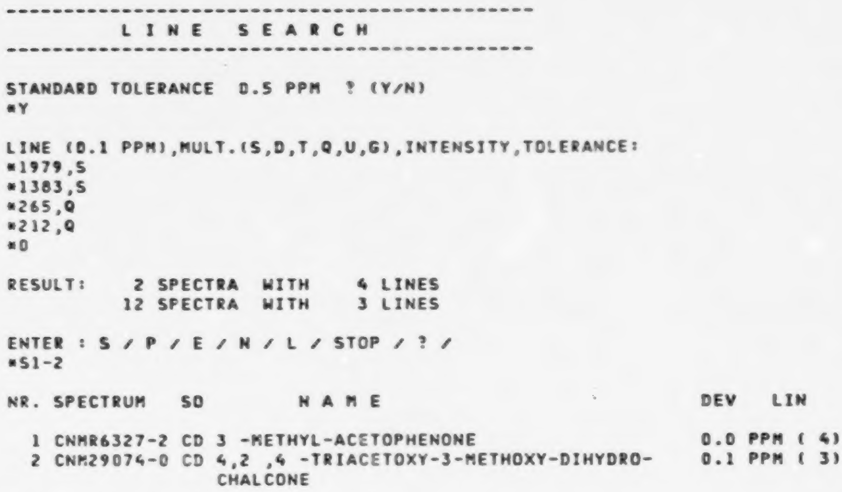


Figure 3

The result is simply a number of lines (given in ppm). Then the searcher has to enter some or all of these lines. An example is shown in Figure 4.



```
---------------------------------------------
         L I N E   S E A R C H
---------------------------------------------

STANDARD TOLERANCE  0.5 PPM  ? (Y/N)
*Y

LINE (0.1 PPM),MULT.(S,D,T,Q,U,G),INTENSITY,TOLERANCE:
*1979,S
*1383,S
*265,Q
*212,Q
*0

RESULT:    2 SPECTRA  WITH    4 LINES
          12 SPECTRA  WITH    3 LINES

ENTER : S / P / E / N / L / STOP / ? /
*S1-2

NR. SPECTRUM   SD        N A M E                       DEV   LIN

  1 CNMR6327-2 CD 3 -METHYL-ACETOPHENONE               0.0 PPM ( 4)
  2 CNM29074-0 CD 4,2 ,4 -TRIACETOXY-3-METHOXY-DIHYDRO-   0.1 PPM ( 3)
                  CHALCONE
```

Figure 4

In addition to the numerical values, all the multiplicities and the intensities may be entered for each line. The searcher can either use a standard tolerance, or he may specify a tolerance himself. In our example the result of the query is that we have two spectra in the database with lines matching the four lines entered. Some short versions of the information content belonging to this spectra are shown, i.e. some short versions of the names. If required it is of course also very easy to retrieve the detailed information shown above in Figure 1.

As I said before, 53.000 spectra are in the database. We have, however, many more compounds in nature whose spectrum has not been measured up to now or whose spectrum is not contained in the database. What can we do if a spectrum which must be interpreted is not in the database? Here, a special retrieval component, named "spectrum estimation," allows the estimation of the chemical shifts expected for a postulated structure. This chemical structure can easily be build up and entered with simple key-boarding commands. For example see Figure 5.

```
--------------------------------------------
       SPECTRUM  ESTIMATION
       SUBSTRUCTURE SEARCH
--------------------------------------------

OPTION : (OR ?)
*>BENZOL,1.K3,7*S,7=0,7=0,4.NO2,P

   140             3C* *2C       110
      =           *       *       =
        =       *           *     =
        12N. .4C             1C. .7S. .8C. .9C
        =       *           *     =
      =           *       *       =
   130             5C* *6C       100

OPTION : (OR ?)
*S

ESTIMATED SPECTRUM :

C  1   S    135.6  PPM +-  2.2 PPM   ( INTERP.  )
C  2   D    128.0  PPM +-  0.0 PPM   (   2 LINES)
C  3   D    124.4  PPM +-  0.0 PPM   (   2 LINES)
C  4   S    149.5  PPM +-  0.0 PPM   (   1 LINES)
C  5   D    124.4  PPM +-  0.0 PPM   (   2 LINES)
C  6   D    128.0  PPM +-  0.0 PPM   (   2 LINES)
C  8   T     45.1  PPM +-  4.7 PPM   ( INTERP.  )
C  9   Q      6.0  PPM +-  0.8 PPM   ( INTERP.  )
```

Figure 5

By applying this retrieval or program component, we are able to calculate nearly every unknown spectrum, on the basis of the correlation between the chemical environment and the spectral parameters of the carbon atoms. These correlations, which are based on the existing spectral data in the database, are also stored in a suitable way for this estimation procedure.

There is another interpretation possibility, namely, a retrieval package which matches the spectrum under consideration to 1000 stored subspectra (transcripts). This package is called spectrum interpretation. For an example see Figure 6.

There is another interpretation possibility, namely, a retrieval package which matches the spectrum under consideration to 1000 stored subspectra (transcripts). This package is called spectrum interpretation. For an example see Figure 6.

```
-----------------------------------------------------------
      S P E C T R U M   I N T E R P R E T A T I O N
-----------------------------------------------------------
OPTION: (OR ?)
*2

NR. LINES WITH MULTIPLICITY AND INTENSITY :
------------------------------------------
1. 197.9 PPM         S              1
2. 138.3 PPM         S              1
3. 137.3 PPM         S              1
4. 133.8 PPM         D              1
5. 128.8 PPM         D              1
6. 128.5 PPM         D              1
7. 125.5 PPM         D              1
8.  26.5 PPM         Q              1
9.  21.2 PPM         Q              1

OPTION: (OR ?)
*S

MATCHING TRANSCRIPT COMBINATION :

NR.  QUALITY FACT.   T-NR.           N A M E
-----------------------------------------------------------------
 1.     1.785          12       ACETYL (*) WITHOUT ORTHO-SUBST.
 2.     1.313           7       METHYL (*) WITHOUT ORTHO-SUBST.
 3.     1.168        1001       BENZENE-1,3-DYL  (K,-)

NO UNASSIGNED LINES
```

Figure 6

The result is the best combination of transcripts obtained for the matching procedure.

The second example I would like to discuss is the ENSDF databank (Evaluated Nuclear Structure Datafile). The ENSDF database is produced in international cooperation by 11 countries (16 institutions). It is implemented at the Fachinformationszentrum and available online via the usual telecommunication networks. The database itself contains nuclear structure and radioactive decay data of all known isotopes. Some figures concerning the number of data sets in the database are given in Table 4:

Table 4.

ENSDF (Evaluated Nuclear Structure File)

Type	Number of datasets
Isotopes	2055
Energy-Levels (adopted)	1961
Decay	2380
Reactions	3835
Sum	8592

The retrieval language consists of the usual commands FIND, DISPLAY, SHOW etc. The different searchable fields (alphanumeric and numeric) are denoted by indicators or descriptors like MA (MASS), EL (ELEMENT) etc. Upon entering the "help command" explanations for every command or searchable field will be displayed on the screen.

Let us now come to some simple examples. The first question is for all data sets with adopted levels and data of the year 1984 (see Figure 7.)

```
CMD
F DA>840000 CD=ADOPTED
 PROGRAM  ID-DACD:        57  DATA SETS FOUND
 PROCESS ? (Y|N)
Y
 -----------------------------------------------------------------------
                DATA SETS FOR STRING ADOPTED       TO ADOPTED
                AND DATE=  840000  TO   999999
 -----------------------------------------------------------------------
    1   61 FE ADOPTED LEVELS                                         83N
    2      CO ADOPTED LEVELS, GAMMAS                                 83N
    3      NI ADOPTED LEVELS, GAMMAS                                 83N
    4      CU ADOPTED LEVELS, GAMMAS                                 83N
    5      ZN ADOPTED LEVELS, GAMMAS                                 83N
    6      GA ADOPTED LEVELS                                         83N
    7      GE ADOPTED LEVELS                                         83N
    8   66 NI ADOPTED LEVELS                                         83N
    9      CU ADOPTED LEVELS, GAMMAS                                 83N
   10      ZN ADOPTED LEVELS, GAMMAS                                 83N
   11      GA ADOPTED LEVELS, GAMMAS                                 83N
   12      GE ADOPTED LEVELS, GAMMAS                                 83N
   13      AS ADOPTED LEVELS                                         83N
   14  110 MO ADOPTED LEVELS                                         83N
   15      TC ADOPTED LEVELS                                         83N
   16      RU ADOPTED LEVELS                                         83N
   17      RH ADOPTED LEVELS                                         83N
 -----------------------------------------------------------------------
```

Figure 7

Now we can try to get more details about one data set, for example data set No. 11. This is shown in the next example in Figure 8.

```
CMD
SHOW NO=11
 COMPLETE DATA FOR   66 GA
 ADOPTED LEVELS, GAMMAS                                    83NDS     84020
 -----------------------------------------------------------------------------
 001      ADOPTED LEVELS, GAMMAS                                83NDS    840201
 002  CL E          FROM LEAST-SQUARES FIT TO ADOPTED EG DATA, EXCEPT AS NOTED.
 003  CL J(L)       FROM ALLOWED LOGFT VALUE IN 66GE EC DECAY.
 004  CL J(P)       FROM G(THETA) IN 66ZN(P,NG).
 005  CL J(X)       THE ASSIGNMENT IS DEPENDENT ON JPI(162 LEVEL)=(3+); FROM
 006 2CL G(THETA) IN 63CU(A,NG), 64ZN(A,NPG).
 007  CG E          MAINLY FROM 66GE EC DECAY AND 66ZN(P,NG); ALSO FROM
 008 2CG 63CU(A,NG), 64ZN(A,NPG).
 009  CG E(D,E)     COMPONENT OF G DOUBLET.
 010  CG RI         RELATIVE BRANCHING IS GIVEN; MAINLY FROM 66GE EC DECAY AND
 011 2CG 66ZN(P,NG), ALSO FROM 63CU(A,NG), 64ZN(A,NPG).
 012  CG M          FOR TRANSITIONS BETWEEN LEVELS WITH JPI'S AS ADOPTED FROM
 013 2CG G SPECTROSCOPIC DATA IN 63CU(A,NG), 64ZN(A,NPG), AND 66ZN(P,NG)
 014 3CG EXCEPT AS NOTED.
 015  CG MR         FOR TRANSITIONS BETWEEN LEVELS WITH JPI'S AS ADOPTED.
 016  CG MR(A)      FROM G(THETA) IN 63CU(A,NG), 64ZN(A,NPG).
 017  CG MR(P,E)    FROM G(THETA) IN 66ZN(P,NG).
 -----------------------------------------------------------------------------
```

Figure 8

Here you see the complete content of the dataset No. 11. As you may recognize, this representation is not very user-friendly. For this purpose, there are other possibilities shown in the next example where only the levels of dataset No. 11 are represented (see Figure 9).

```
CMD
SHOW-L NO=11
 DATA FOR   66 GA ADOPTED LEVELS, GAMMAS                                     83NDS
 ------------------------------------------------------------------------------------
 NMBR     E-LEVEL      DELTA-E      JPI          HALF-LIFE
 ----   ----------     -------   ----------     ----------
 001            0                 0+             9.49 H
 002        43.81        3        1+             18.0 NS
 003        66.14       4         (2+)           23.0 NS
 004      108.874       21        1(+)           1.2 NS
 005       140.18        9        (2)
 006       162.43        5        (2,3+)         13 NS
 007      234.066       25        1+,2+
 008       290.90        3        1(+)
 009       335.27        6        (2)
 010      381.859       24        1+
 011       392.97       13        (2,3)
 012       401.38       13        (2)
 013       415.30       14        (4+)
 014       424.27       11
 015       459.88        9        2
 016       516.04       21        (4+)
 017       530.62       15        2,3
 ------------------------------------------------------------------------------------
```

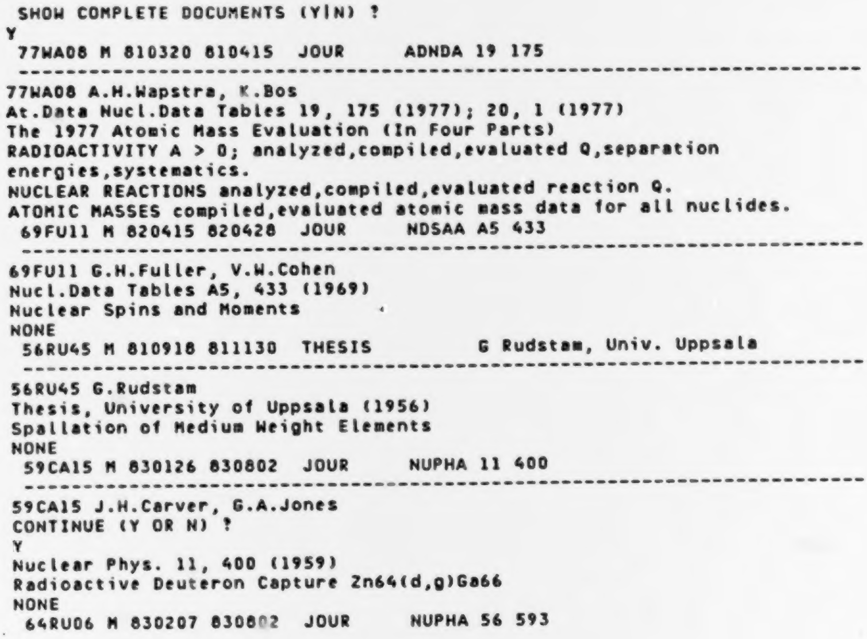
Figure 9

Sometimes the user is interested to know the sources where the data came from. We can therefore now retrieve all the references used for the evaluation of this dataset by a simple command. This is shown in Figure 10.

```
CMD
SHOW-REF NO=11
 THERE ARE      7 REFERENCES IN DATA SET    6603100
 ------------------------------------------------------------------------------
 77WA08    JOUR      ADNDA    19 175
 69FU11    JOUR      NDSAA    A5 433
 56RU45    THESIS             G Rudstam, Univ. Uppsala
 59CA15    JOUR      NUPHA    11 400
 64RU06    JOUR      NUPHA    56 593
 50LA55    JOUR      PHRVA    80 651
 67VA13    JOUR      NUPAB    A98 585
 ------------------------------------------------------------------------------
 NUMBER OF DOCUMENTS SHOWN=       7
```

Figure 10

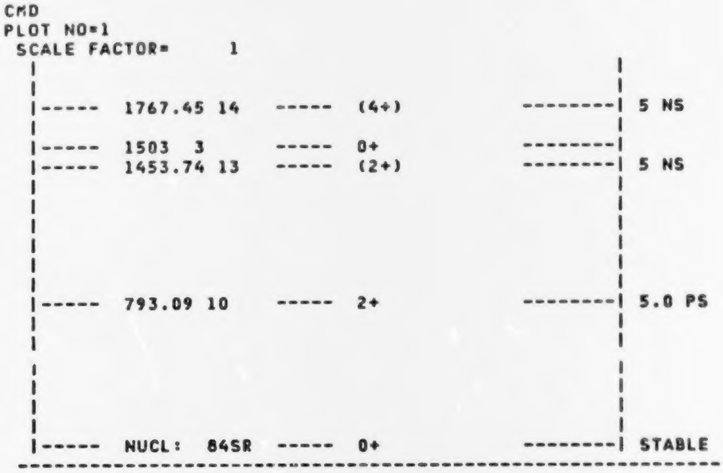
Some references have been found. They are presented in a short version. Of course the complete documents can also be looked for (see Figure 11).



```
 SHOW COMPLETE DOCUMENTS (Y|N) ?
Y
 77WA08 M 810320 810415  JOUR     ADNDA 19 175
---------------------------------------------------------------------------
77WA08 A.H.Wapstra, K.Bos
At.Data Nucl.Data Tables 19, 175 (1977); 20, 1 (1977)
The 1977 Atomic Mass Evaluation (In Four Parts)
RADIOACTIVITY A > 0; analyzed,compiled,evaluated Q,separation
energies,systematics.
NUCLEAR REACTIONS analyzed,compiled,evaluated reaction Q.
ATOMIC MASSES compiled,evaluated atomic mass data for all nuclides.
 69FU11 M 820415 820428  JOUR     NDSAA A5 433
---------------------------------------------------------------------------
69FU11 G.H.Fuller, V.W.Cohen
Nucl.Data Tables A5, 433 (1969)
Nuclear Spins and Moments
NONE
 56RU45 M 810918 811130  THESIS        G Rudstam, Univ. Uppsala
---------------------------------------------------------------------------
56RU45 G.Rudstam
Thesis, University of Uppsala (1956)
Spallation of Medium Weight Elements
NONE
 59CA15 M 830126 830802  JOUR     NUPHA 11 400
---------------------------------------------------------------------------
59CA15 J.H.Carver, G.A.Jones
CONTINUE (Y OR N) ?
Y
Nuclear Phys. 11, 400 (1959)
Radioactive Deuteron Capture Zn64(d,g)Ga66
NONE
 64RU06 M 830207 830802  JOUR     NUPHA 56 593
```

Figure 11

Concerning the levels we have also the possibility of showing the result in the form of a level scheme. An example is given in Figure 12.



```
CMD
PLOT NO=1
 SCALE FACTOR=      1
  |                                                     |
  |                                                     |
  |-----  1767.45 14   -----  (4+)          --------|  5 NS
  |                                                     |
  |-----  1503  3      -----  0+            --------|
  |-----  1453.74 13   -----  (2+)          --------|  5 NS
  |                                                     |
  |                                                     |
  |                                                     |
  |                                                     |
  |                                                     |
  |                                                     |
  |-----  793.09 10    -----  2+            --------|  5.0 PS
  |                                                     |
  |                                                     |
  |                                                     |
  |                                                     |
  |                                                     |
  |                                                     |
  |-----  NUCL:  84SR  -----  0+            --------|  STABLE
 ------------------------------------------------------------------
```

Figure 12

Up to now I have demonstrated the representation possibilities of the data and also some typical examples for the content. Of course, in the case of numerical databanks like ENSDF, we can also ask some typical questions which are very different from the questions in the case of bibliographic databases. Such a question is, for example, the query for all cases where we have a gamma transition with an energy between 600 and 6[illegible] keV and a half life of the excited mother level between one second and one minute. An example is shown in the next Figure 13.

```
CMD
F GE=600 TO 604 PT=1 S TO 1 M
 NDSET  E-GAMMA    LEVEL MASS ELEM              TEXT              HALF-LIFE
 ----- ---------- ----- ---- ---- -------------------------- ----------

   32      600.00    10    99 ZR   99Y B- DECAY                 1.50 E+00
   34      600.10     5   100 MO   100NB B- DECAY               1.50 E+00
   75      600.30     0   184 PT   184AU EC DECAY               5.30 E+01
  126      601.05     2   137 XE   137I B- DECAY:G              2.45 E+01
  127      601.09     2       XE   138I B- DECAY:DELAYED N      6.41 E+00
  128      601.84     8   139 CS   139XE B- DECAY               3.96 E+01
  177      602.85     4    91 SR   91RB B- DECAY                5.84 E+01
  178      602.60    57    93 SR   93RB B- DECAY                5.86 E+00
  180      602.60     8    99 ZR   99Y B- DECAY                 1.50 E+00
  210      602.21    15   143 LA   143BA B- DECAY               1.45 E+01
  217      602.00     3   154 ER   154TM EC DECAY (3.0 S)       3.00 E+00
  262      603.70     5    79 AS   79GE B- DECAY (19.1 S)       1.91 E+01
  295      603.50     2   135 I    135TE B- DECAY               1.92 E+01
  319      603.20    34   107 RU   107TC B- DECAY (21.2 S)      2.12 E+01
  362      604.70    21   119 CD   119AG B- DECAY               2.10 E+00
  377      604.63     0   141 CS   141XE B- DECAY               1.72 E+00
 ----------------------------------------------------------------------
```

Figure 13.

I hope that these two examples of databases and their retrieval give some idea of the typical retrieval strategies in the case of numerical databases. Unfortunately today we have the situation that each numerical database differs from most other databases in its retrieval strategy. Because of the lack of time, however, I am not able to show more examples and more details.

6. Access

Various numeric databases are nowadays offered online via the usual telecommunication networks. Since even the national telecommunication networks like for example DATEX-P in Germany, TRANSPAC in France, DATAPAC in Canada, DDX-P in Japan etc. are now connected with each other it is no problem to have access to the corresponding hosts from nearly every place of the world. The retrieval of the corresponding information from a numerical database is in many cases not more complicated than the retrieval from a bibliographic database (see the examples given above).

A certain problem is surely that the structure and the retrieval compounds vary from numerical database to numerical database, but there are even recent developments beyond that. Some institutions like the Chemical Abstract Service (CAS) and the Fachinformationszentrum Energie Physik Mathematik Karlsruhe are now in the process of linking their computers through a dedicated telecommunication line. Their aim is to form a new international scientific and technical information network called STN International. This network consists of nodes. A particular database will only be loaded at one node. A searcher will then access the nearest node and will be switched automatically to that computer in the network where the database to be searched is stored. This latter development will have major consequences especially for the database offered, normal access will thus be facilitated.

In order to give you also some impression how often numerical databases are offered by online service organisations a kind of survey is shown in the following Table 5.

Database distribution by online service organization

(according to S.V. Meschel, Online Review 8 (1984), 77)

Number of databases marketed	Number of services ordered by type of databases offered		
	Primarily numeric*	Primarily bibliographic	Total
1-5	93	21	114
6-20	27	10	37
21-40	3	4	7
41-60	–	1	1
Over 60	3	2	5
Total	126	38	164

* This column includes referral and full text databases

Table 5

As you may recognize numeric databases are not only marketed by large online service organisations but also to a very large extent by various small distributors. The reason is that these databases are very specialised and sometimes even relatively small, addressing a small specialised audience.

SCIENTIFIC LITERATURE IN FOREIGN LANGUAGES AND LIBRARY USERS

Dies van Bergeijk

International Translations Center, Delft, The Netherlands

Abstract

Scientific literature written in foreign languages is put aside too often because the user is not able to read it. In the Western world this reaction can have serious implications, especially if this literature is written in a highly inaccessible language of a country such as Japan, which is (technically and scientifically) highly developed (in science and technology).

Are library users and librarians sufficiently aware of the tools that may help to solve the foreign languages problem? Some of the existing tools are discussed when the user or librarian is searching for literature and is confronted with a document written in a language he does not understand. Special attention is given to the on-line database on existing scientific translations.

A plea is made not only for the education of the user in this field but also for the initiation of the librarian.

Introduction

Contrary to the Middle Ages, in which scholars published their findings in Latin, scientific literature is nowadays published in various languages. With the exponential growth of the number of scientific publications, the number of languages in which these publications have been written has also increased.

Some utopists hoped and dreamt that an artificial language could take over the function of Latin. Neither Esperanto, nor Volapük, nor Ido has succeeded in becoming a scientific lingua franca.

After the Second World War it was believed that English was to become the supreme language for such a purpose. In some spheres of society, English has indeed become the main language in international communication, for example in shipping and in aviation. You can sail or fly around the world using only English as a means of communication.

In the dissemination of scientific information this is not the case.

Of course I admit that English is the main language (in our scientific society) but certainly not the only language.

In my opinion, nowadays more and more scientists who do not have English as their mother tongue have a tendency to publish in their own language. Growing nationalistic feelings, aversion to linguistic imperialism as well as the lack of sufficient knowledge of another language may be the underlying reasons for this tendency.

Language barrier

There is, no doubt, a language barrier that obstructs the flow of information. This barrier is growing instead of waning. Intensified international contacts and the transborder flow of information make the influence of this barrier more tangible. As the number of computerized databanks and databases is growing and the on-line use of these services increases, the existence of literature in foreign languages becomes more noticeable and so does the wish to make use of this literature.

Mrs. Mickey Risseeuw said at the Cranfield Conference last month that[1] Engineering Index provides English language abstracts of selected primary documents from over 40 different countries and published in over 20 languages (German, French, Russian, Japanese, etc.). Approximately 72 % of the indexed publications are in English.

Nearly 75 % of the journal literature abstracted by Chemical Abstracts Service originates from approximately 140 countries other than the US and is written in 55 different languages, with Russian, Japanese, German and French leading the foreign language contributions.

Biosis abstracts and indexes material from more than 100 countries in 20 languages. 19 countries provide more than 78 % of the total items.

"The first step in solving the problem of the linguistic barrier is to recognize its existence. Too often many people refuse to recognize the facts. Everybody is losing information due to the existence of the linguistic barrier", as the director of CDST of CNRS, Mr. Michel said in an article in the Journal of Information Science.[2]

Of course you can become an excellent engineer or a first class physician without ever having taken notice of work published in a foreign language.

As soon as you have to do research, scientific research, you have to know what others have published in your field or in related fields of interest. You all know that research and development are vital to the economy. So do not close your eyes to the loss of information resulting from the language barrier and try to overcome this barrier.

Overcoming the language barrier

What can be done to overcome the language barrier? What can you do about it as librarians?

Knowledge of other languages

An obvious thing to do is to learn one or more foreign languages or at least acquire some knowledge of them. Learning languages enriches the mind and enables the learner to acquaint himself with the cultures and ways of living of other peoples, and as such it is a commendable solution.

Libraries can contribute in many ways, for example by making courses available, as is done by the library of which we are guests today, where you can borrow a language course on grammaphone records or tapes.

Libraries should offer a good selection of dictionaries and textbooks. Furthermore it is important that library staff have some linguistic knowledge.

Seeking applicants for a science reference librarian opening, the Library of Congress stated that, next to the possession of a master's degree in library science with a bachelor's degree in electrical or electronic engineering, physics, mathematics, chemistry, oceanography, the applicant should also have the ability to read written Japanese scientific texts easily.[3]

Perhaps this view deserves imitation. And for knowledge of languages in other scripts, I would like to stress the importance of knowledge of the current transliteration schemes. Thinking of the Russian language, for instance, it may mean the beginning of gaining access to this literature. During their education, librarians should pay some attention to this aspect. There are some good textbooks on this subject.

Other tools

What other tools are available to overcome the language barrier? Can modern techniques contribute to the solving of the problem?

A distinction should be made here, the language barrier is felt in two different spheres. First it may obstruct literature searches to such an extent that they cannot be done efficiently and second if the search has been successful and the document is retrieved and delivered it may turn out to be incomprehensible owing to the language.

Now give your attention to the first phase for a few moments. What tools are available, what can the librarian do to assist the user who searches for literature when the language barrier pops up?

You all know that literature searches are nowadays often done with the many computerized systems for information retrieval. We are living now in the on-line age.

To instruct the user that on-line searching can be learned quickly and done inexpensively with a simple terminal and a modem, serves no purpose, if he finds out that the host manuals are written in a language he cannot read, or that thesauri are in unfamiliar languages.

Information officers, and often librarians, have to know how to handle this situation. They should be able to translate the manual orally or know which colleague could do this, or preferably, a translation of the host manual should be available in a language which most of the library users can understand.

Librarians should know which thesauri are available in a multilingual version in order to know which equivalent can be used for maximum search result in a database containing material in another language or in a multilingual database.

In this respect I like to mention that the Commission of the European Communities has developed plans to create a thesaurus database. Such a database will be an excellent information tool for database users, next to its potential usefulness for designers of thesauri and a means to avoid unneccessary duplication in thesaurus development.[4]

In the future there will be systems available for automatic translation of titles and abstracts. The TITUS IV translation system coupled to the database of the French Institute de Textile is the only system already in operation, if I am correctly informed.

Translations

Now we have reached the second phase: The search has been successful, the document is retrieved and hopefully delivered, but it turns out that the user cannot read the foreign language.

What can the librarian do for his users?

Translation is the only answer. The librarian should be able to advise the client how and where to find a translator. Of course any well-provided library holds the translators' directories in its collection.

But can the librarian advise the users otherwise? When automatic translation systems are more common in the future, will the library know which language pairs and which subject fields such a system can handle?

It is understood that in Maastricht such a system is already operational or will be operational soon, using the Systran automatic translation system.

But it is even more important to know whether an existing translation is available. Translations are costly, both in time and in money. This will also be true if a high-quality translation has to be produced by an automatic translation system making human post-editing necessary. The use of existing translations again is therefore the way to break the language barrier inexpensively and quickly, but how to find these translations.

In 1971 in a report of the University of Sheffield on the language barrier it was stated: "It should be ensured that library staff who actually deal with library users are themselves aware of the full range of translating services and possibilities".[5]

Many guides to existing translations are available. The coverage of most of these are, however, restricted either to translations prepared for or held by a particular organization or are limited to a particular subject field or scientific discipline, or to a restricted number of languages.

The proliferation of information on translations, a kind of literature often considered to be peripheral to the original literature, has led to the creation of certain centres which are specialized in the dissemination of this material.

The best known are the National Translations Center in Chicago, USA, housed in the John Crerar Library of the University of Chicago, the All-Union Centre for Translation of Scientific and Technical Literature and Documentation (VCP), Moscow, USSR, Aslib, in London, which maintains the Aslib Index of Unpublished Translations and, in Canada, the Canadian Index of Scientific Translations housed in the Canada Institute for Scientific and Technical Information of the National Research Council (CISTI), and, of course, here in Delft, where we have assembled today, the International Translations Centre.

Since 1961 this Centre has maintained an index of translations of scientific and technological literature and has published lists of translations notified to the Centre. The Centre runs an information service for anyone who wants to know if a translation exists.

A database on existing translations

Since 1978 the International Translations Centre (ITC), Delft, the Netherlands, and the Documentation Centre of the Centre National de la Recherche Scientifique (CNRS), Paris, France, have been running a database on existing translations, the WTI for short. This was made possible by the Commission of the European Communities, which supported this project financially for a period of three years.

Both organizations have used the computer for many years as an aid to compiling their printed indexes: the World Index of Scientific Translations and the Bulletin des

Traductions respectively. These publications, together with the Transatom Bulletin published by the Commission of the European Communities, which listed translations in the field of nuclear sciences, were merged in 1978 into one publication: WORLD TRANSINDEX,[6] generated by the CNRS computer by way of the CNRS PASCAL system. The printed WTI is published ten times a year announcing approximately 2500 new translations in every issue, arranged according to the COSATI classification system, slightly amended to meet the requirements of the Commission of the European Communities.

In addition to the references section the WTI contains an alphabetical source index and an author index.

Online translation-spotting

With the publication of the printed WTI a great contribution has been made to "translation-spotting", as J.M.Gibb (1977) calls it in his lecture at the Third European Congress on Information Systems and Networks, Luxemburg.[7]

From the outset of this joint venture, this contribution has been particularly valuable because the aim has been, as Gibb says: "through contributions of various partners one integrated computerized database should be generated and maintained".

The WTI is available online on ESA/IRS, Frascati, Italy, and contains at the moment more than 155,000 references. Other hosts will make this unique database available on other systems.

Short description of the World Transindex database (WTI)

The basic principle in handling the data of a translation in the WTI is to bring together two references into one single bibliographic record when the document described (in this case the translation) is linked with another document (the source document). This implies that in theory there can be two complete sets of data elements, one for each document. The bibliographic record also shows the acronym of the holding organization for the translation or gives details of the serial or published work in which the translation appears. For a detailed description of the WTI database reference is made to the user manual (WTI 1981).[8]

Advantages of online access to WTI

When an online literature search is done and a translation is required from the document retrieved, an easy switch to the WTI file will promptly inform the searcher whether a translation is available and if so, where it can be ordered. Furthermore, the WTI database also offers more search facilities than the printed version.

In the printed version the searchable elements are restricted to the original documents and the authors. The searcher needs full bibliographic data so that he can make proper use of the printed version.

All the references are arranged according to the adapted COSATI subject classification. If he wants to search on this classification he has to peruse every separate issue of the World Transindex on his subject of interest.

Limitations of the database

If the librarian wishes to serve his clients well, he (and anyone who uses the database) should be familiar with the limitations of the database. The WTI contains only translations of scientific works, such as journal articles, conference papers, books, scientific patents, reports and similar documents. No translations of newspaper articles, product descriptions or the like are included.

Furthermore the database refers to translations of technical and scientific literature and does not contain records on disciplines such as humanities and social sciences, although notifications of translations of these disciplines are processed in cases where there is a link with a technical subject. Nor are included translations of the so-called cover-to-cover translated journals. For these an excellent bibliography has been compiled: "Journals in Translation".[9]

Before searching the database for a translation of a journal article, the librarian (or user) should realize that it is essential to check the bibliography first, so that he can establish whether the relevant article does or does not originate from one of the journals which are translated cover-to-cover.

Librarians who assist or educate users in the employment of search strategies for translations should be well aware of this fact, so that an optimum can be made of this tool. Moreover, as far as the over-all potential of translations is concerned it should be realized that from the original literature only a limited portion is translated or is going to be translated. Exact figures on the amount and distribution of translations made are hard to give and differ considerably depending on the subject field.

The production of a translation is costly and in most cases it will be undertaken only when the importance of the original has been recognized, for instance, by the inclusion of it in an abstract journal or in other sources.

Those who would like to read a translated version of a work recently published in a language which they do not understand should realize that translating is time consuming and that is probably the reason why they cannot find the notification included in the WTI.

Normally a notification of a translation is not available until six to ten months after the publication of the original.

I would like to stress these last remarks and librarians ought to bring these to the attention of users.

Improvements of the WTI database

The producers of the WTI database are aware of the shortcomings and try to improve the database if feasible.

Recently an extension with translations from Western languages into other Western languages was realized. The 1977 file of the International Translations Centre was added to the database. An online ordering service called PrimorDial became operational through the ESA/IRS host organization. The translations will be supplied by the Dutch participant in the ITC network: the Dutch Foundation for not Readily Accessible Scientific Literature.

Another important improvement of the WTI would be the inclusion of notifications of articles from cover-to-cover translated journals. Suppose this were to be realized and suppose a user were interested in the works of a certain author and all these works were written in a language he cannot read, then he would be in a position to select from this database all the translations that are available from the works of that author. The user need not wonder whether other databases should be consulted (to get a complete picture of all the existing translations (ad-hoc or published in a cover-to-cover translated journal)). The costs involved prohibits the execution of this project at the moment.

Of course it is conceivable that a link can be made between the database and systems dealing with electronic publishing and automatic translation, but the problems involved are so enormous yet that for the years to come we have to work with the database as it is.

Continual endeavours should be made to maintain the database as comprehensive as possible.

If librarians have information on translations which are prepared in their library or are presented to them they can contribute to this cause by sending this information to the International Translations Centre for inclusion in the base. They should, of course, use the database and stimulate the users of the library to follow their example.

Conclusions

The language barrier is still a severe hindrance in the dissemination of scientific information. We should do everything within our possibilities to prevent important information from getting lost.

Librarians should know and advise clients where translations can be made, including the possibilities of the production of machine translations in the (near) future. They should also know the disadvantages of such translations. Librarians who assist in carrying out literature searches should know which multilingual thesauri are available and where. They should know where existing scientific translations are available and how to obtain them expeditiously. Nowadays libraries and librarians have to cope with reduced resources, they have to find a balance between acquisition and other services. The services which can be given should therefore be satisfactory.

It is not too difficult to compute the costs that are involved when tools are used for delivering translations to clients but it is more difficult to make an estimate of the profits for the clients, let alone the estimate of the costs and the value of the information lost.

I would like to conclude with the recommendation of Sandra R. Ellen of the BLLD when she surveyed the foreign language problems of the research workers: "information on translation services and on guides should be made more widely available. Librarians should ensure that users are informed of existing services and must themselves be aware of them".[10]

References

1. RISSEEUW, M. World Transindex: an efficient tool to overcome the language barrier. In: Cranfield, 9th Cranfield Conference on Mechanised Information Transfer, July 1984.

2. MICHEL, J. Linguistic and political barriers in the international transfer of information in science and technology. Journal of Information Science, vol. 5 (1982) no. 4, pp. 131-135.

3. Library of Congress Information Bulletin, vol. 42 (1983) no. 37, pp. 311.

4. Multilingual Thesaurus Policy Outline, CIDST/Multi/59/80 Rev.2, 1980.

5. HUTCHINS, W.J., PARGETER, L.J. & SAUNDERS, W.L. The language barrier. Sheffield, University of Sheffield, 1971, p.207.

6. World Transindex, 1, 1- Delft, International Translations Centre. 1978-

7. GIBB, J.M. Translation-spotting in the European Community. In: 3rd European Congress on Information Systems and Networks. Overcoming the language barrier. Luxemburg, 3-6 May 1977. München, Verlag Documentation, 1977, pp. 219-225.

8. World Transindex. General description and online access on ESA/IRS (Quest system). Paris, CNRS-Informascience/Delft, Centre International des Traductions, 1981.

9. Journals in Translation. Boston Spa, Wetherby, British Library Lending Division, Delft, The International Translations Centre, 1982.

10. ELLEN, S.R. Survey of foreign language problems facing the research worker. Interlending Review, vol. 7 (1979) no. 3, pp. 31-41.

ON-LINE RETRIEVAL IN NUMERIC DATA BASES: SPECIAL FEATURES AND EXAMPLES

Josef L. Staud

University of Konstanz, Federal Republic of Germany

Abstract

The majority of data bases available on-line is nonbibliographic. Among these the so called numeric data bases play an important role. The primary purpose of the article is to compare numeric data bases with others, based on a general classification of data bases which are available on-line. The major distinction is hereby made between systems managing information with multivariate attributes (basis for statistical manipulations) and those dealing with information in textual form (both bibliographic, full text, textual-numeric and others). In general, numeric data bases are in the first group allowing (together with their software) mathematical and statistical manipulations, econometric modeling and generating output in formatted tables and graphs.

Although these systems are user-oriented, that is, the use of the system does not require a background in computer programming, this data structure forces special techniques and allows special features in retrieving and data manipulating. The particular features of retrieval in numeric data-bases will be explained, especially the data structure, the form of derived data (aggregate data, time series, ...) and the retrieval of this type of information.

As an example of on-line retrieval and data manipulating with numeric data bases some aspects of AREMOS (A Retrieval and Econometric Modelling System) and the CRONOS data bases, both offered by CISI (COMPAGNIE INTERNATIONAL DES SERVICES EN INFORMATIQUE) will be presented:

- type of data: time-series, for example the CRONOS- and COMEXT-data bases from the Statistical Office of the European Community.
- retrieval: in two different ways, first similar to normal information retrieval, second in a way only possible for data with multivariate attributes
- mathematical and statistical manipulations
- generating output in formatted tables and graphs.

Finally an overview will be given of

- the firms offering this data and these systems
- the retrieval languages used and
- the data bases offered, especially for data bases in business and economics.

The paper will also contribute an answer to the question, what kind of role numerical data bases will play in the field of information resources available on-line.

Introduction

The ideas presented in this paper may be somewhat surprising, especially with respect to the distinction of textual and property-type information, the latter with specific rules for "Information Storage and Retrieval". These ideas should be taken as a first approach in explaining the retrieval of property-type information in a specific way. It is an aim of this paper to enter into a discussion about the peculiarities of this type of fact-retrieval, a discussion which, as far as I know, has not been developed. The following topics will be dealt with:

1. Numerical data bases in the universe of online data bases
1.1 The current classification
1.1.1 Source data bases versus reference data bases
1.2 The "new" classification
1.2.1 Properties and manifestations
1.2.2 Processed Information : Aggregated Data and Time-Series
1.2.3 Types of information in today's online retrieval
1.3 "Old" and "new" classification
2. Retrieval of property-type information
2.1 Retrieval
2.2 Peculiarities
2.3 Statistical Processing
2.4 Hosts
3. Online-retrieval with statistical data bases

1. Numerical data bases in the universe of online data bases

The data bases available online differ in a number of ways: by subject, in the languages used, in geographic coverage, in the frequency of updating, and in the type of information or data that they contain. This last difference is of great importance to the methods of Information Storage and Retrieval and the construction of the data base systems used. Because of this the current classification of online data bases concerning the stored type of information will be described. It will be shown that this classification causes some difficulties in the case of numerical data bases. That is why some aspects of a new classification are represented.

1.1 The current classification

1.1.1 Source data bases versus reference data bases

In the discussion about online data bases a classification has established itself, which goes back to library-context. It distinguishes on the highest level between reference data bases and source data bases and service data bases (FROST and SULLIVAN). This classification is based on the one of primary and secondary information which is well known in library science. In figure 1.1/a the whole classificaton is presented[1].

According to this, the authors mean by reference data bases collections of information that refer to source documentation. These data bases inform the searcher what kind of information on a certain topic is available and where he can find it.

One subset of this is bibliographic data bases. They offer the user the information needed to obtain access to published source documents like published articles, books, reports etc. This information contains bibliographic and content-based categories and possibly an abstract. They are held as a means of access to the original documents.

Another subset of the reference data base classification is referral data bases. The information which is held in such a data base is a set of data as to where further information to a certain topic can be found. For example to projects, institutions and to other nonprinted/document sources.

Source (or service) data bases offer the searcher direct access to the source information. No further research should be required once an enquiry in such a data base has been successful. Source data bases are classified in four categories: numeric, textual-numeric, property and full text data bases. In full text data bases the whole (or a long) text of a book, an article or another printed source is documented. The only rule of importance is, that it is a "real text" and no information in the form of properties or anything like that. This does not mean that full text data bases do not hold bibliographic and content-based categories for further and faster retrieval of the text. At present, especially in the case of newspaper data bases, full-texts are used. Speaking of "property data bases" the authors refer to handbook-type data bases offering the user collections of specific property data in the field of chemistry and physics. They often contain information about chemical structure, metal properties and physical, chemical and atomic element relationships.

In this classification, the universe of data bases dealing with numerical information can be found under the topic "numeric and textual-numeric data bases". Numeric data bases are those, which contain original data or statistical material. They include economic data, time series, aggregate data, etc. In addition the data can be manipulated statistically. This data is always numerically coded information or numeric data values. These data bases can be used by the searcher to develop additional statistical information; they are the basis for projection or for models. Speaking of textual/numeric data bases, the authors refer to those which will not only give original numeric information to the user but also contain related textual information. They can be found, for example, in the field of company information, where trading figures are often combined with items descriptive of the company, its officers or its products. Often the textual part of such data bases is designated as facts or "fact-answer type information" (MESCHEL 1984, p.78).

Table 1.1/a gives an impression of the distribution of data bases in accordance with this classification. It is taken from KNOWLEDGE INDUSTRY PUBLICATIONS (1982). It can be seen that numeric data bases hold the same part as bibliographic data bases. They play an important role, especially in the field of business information.

Figure 1.1/a: Classification of online data bases

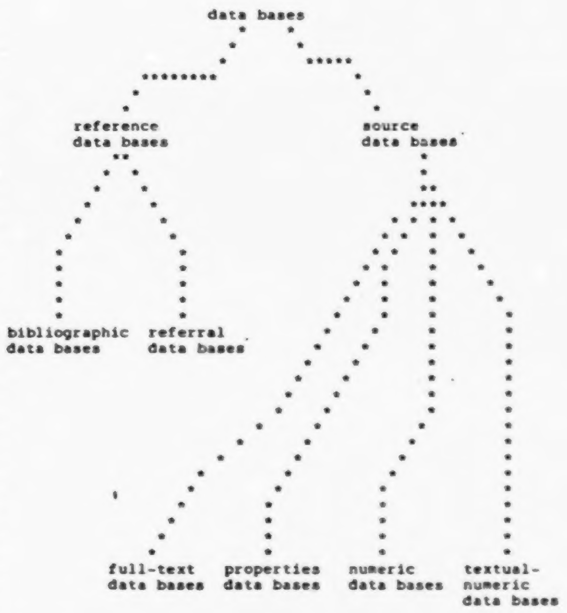

data bases
reference data bases
source data bases
bibliographic data bases
referral data bases
full-text data bases
properties data bases
numeric data bases
textual-numeric data bases

Table 1.1/a: Distribution of Data Bases by Type

Type of Data Base	% of Total
Reference	48 %
Bibliographic	38
Referral	10
Source	52
Numeric	38
Textual numeric	5
Properties	4
Full text	5
Total	100%

Source: Guide to Electronic Publishing, copyright 1982 Knowledge Industry Publications, Inc. Based on analysis of almost 500 online data bases.

This classification causes some difficulties. The most important is, that there is no possibility to differentiate those data bases whose data can be manipulated statistically. But since these data bases play a more and more important role in the field of online retrieval, and because this data give some special features and their retrieval has some pecularities, (which have also implications for the underlying systems), they should be regarded separately. The difficulties arise because this classification is oriented to the simple distinction of whether a field (in the data base system) contains a number or not. But numbers can have very different meanings in information processing, meanings with consequences for system design, information retrieval, etc. These different meanings can be recognized (and taken into consideration) by using the concept of properties and manifestations as known in Statistics and Theory of Measurement.

1.2 The "new" classification

1.2.1 Properties and manifestations

In this article the terms property and manifestations of a property are used in the sense of PFANZAGL's "Theory of Measurement". That means, property stands for weight, color, etc and manifestations of a property for (in the case of color) red, yellow; etc. In accordance with that notion, properties and manifestations are used in measurement processes (assigning a property means forming classes within a certain set of objects or "domain of discourse"; compare also figure 1.2/a. That is, a property must always be seen in context with a certain class of objects, which will be divided by the property into disjunctive subsets. Each of these subsets is classified by a different manifestation. Assigning the different manifestations to these subsets is nothing else but measurement. Simple examples are the property "sex" (in relation to all human beings) with the manifestations female and male and the property "salary" for the employees of an organization.

In the same way as properties may be assigned to any object whatever, they can be assigned to properties themselves. One of these leads to scales and the manifestations nominal, ordinal, interval, ratio scale (and others). The difference between these scales is a very central one: properties on nominal level only reflect the similarity or dissimilarity of objects, therefore, only the similar/dissimilar relation can be regarded. Such a qualitative property is also the basis for the selection of the "well-defined set of objects" or "domaine of discours" regarded in the statistical analysis. The manifestations of such a property are not numerical ones but textual (e.g. male/female). Nevertheless these manifestations normally are coded numerically for ongoing statistical processing. In contrast to these qualitative properties, which lead to nominal scales, ranked properties and ordinal scales provide information about a specific ranking order, in addition to the similar/dissimilar-relations, cited above (e.g. high grades and low grades in school). That means, it is possible to show smaller/larger relations. The manifestations

Figure 1.2/a: Properties and manifestations

The terms property and manifestation here are used in the sense of PFANZAGLS "Theory of Measurement"(1)

- Assigning a property means forming classes within a well-defined set of objects.
- Every class will be characterized by a different manifestation of the property.
- The assignment of objects to manifestations is what is called measurement. Questions dealing with this are part of the Theory of Measurement.
- Levels of Measurement (property concerning properties themselves):
    - qualitative properties/nominal scales
    - ranked properties/ordinal scale
    - quantitative properties
        - interval scaled
        - ratio scaled
        - .....

For Example:

a) Set of objects: employees of an company
potential properties:

sex	with the manifestations	female male
salary		3000.-- DM 5000.-- DM .....

b) Set of objects: business transactions
potential properties:

"destination"	with the manifestations	home country foreign country
"type"		purchase sale
time		day of signing

Properties like these lead to the EUROSTAT data bases like CRONOS and COMEXT here are very often in word form, e.g. "very good/good/bad", but one can always project them on any sequence of numbers one wants, if the sequence concerned satisfies the condition of ranked order.

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(1) PFANZAGL, J., Theory of Measurement. Würzburg, Wien 1971

In the field of fact-retrieval, a third type, the quantitative properties with numerical manifestations seem to be most common (e.g. data concerning foreign trade of economies). In addition, these numerical manifestations may also be differentiated according to the calculations allowed (compare PFANZAGL 1971, especially part 1.8, for a detailed overview).

Properties and manifestations in this sense are often part of a text and in this case would be handled exactly like information in the normal information-retrieval. The situation changes for "Information Storage and Retrieval" when properties and their manifestations appear isolated in the form of a table. This case, particularly if more than one property is under consideration, will be discussed in the following section.

In statistical analysis it almost never occurs in practice that we consider one property only, for it is the relation between properties which is of interest. Every object can then be identified by a sequence of manifestations. On the condition that the investigation has been planned carefully each object receives a manifestation for every property. Such a multidimensional property structure can be represented as a table or a data-matrix. For this the manifestations for each object are indicated in the same order. Then the "vectors" for all the objects will be arranged one beneath the other. Figure 1.2/b gives an illustration of the correlation between objects, properties and manifestation. To recognize information as properties has some consequences. One concerns the retrieval of this type of information. It will be explained in the next sections. Another concerns the possibilities for calculation and statistical processing. Nominal data cannot be added, multiplicated, etc. It makes no sense to calculate the mean of 1 and 2 if 1 means "female" and 2 "male" in relation to the (qualitative) property sex. Corresponding to this, for the other types of properties only certain mathematical and statistical operations are allowed.

Figure 1.2/b: Objects, properties and manifestations

Let U, V, W, ..., Z be properties with k_u, k_v, k_w, ..., k_z manifestations, respectively.
Let u_i (i=1, ..., k_u), v_i (i=1, ..., k_v), w_i (i=1, ..., k_w), ..., z_i (i=1, ..., k_z) be the manifestations, respectively and O_1, O_2, O_3, ..., O_m the objects of a well-defined set.

That means
U has the manifestation $u_1, u_2, u_3, \ldots, u_{k_u}$
V has " " $v_1, v_2, v_3, \ldots, v_{k_v}$
W has " " $w_1, w_2, w_3, \ldots, w_{k_w}$

Let u'_j u_i (i=1, ..., k_u; j=1, ..., m)
v'_j v_i (i=1, ..., k_v; j=1, ..., m)
w'_j w_i (i=1, ..., k_w; j=1, ..., m)

Then the multidimensional properties about the objects can be presented in the following way in a table (raw data):

	U	V	W	...	Z
O_1	u'_1	v'_1	w'_1	...	z'_1
O_2	u'_2	v'_2	w'_2	...	z'_2
O_3	u'_3	v'_3	w'_3	...	z'_3
.	.	.	.	...	.
.	.	.	.	...	.
.	.	.	.	...	.
O_m	u'_m	v'_m	w'_m	...	z'_m

The term multidimensional property reflects the idea to build a n-dimensional space with the n properties and to assign every object to "his" point (his combination of manifestations).

1.2.2 Processed Information: Aggregated Data and Time-Series

Most of the collected data which are at present available in numeric data bases are aggregated. Since this has consequences for the retrieval and processing of this data, this data type will be briefly outlined here. Properties form the basis for aggregation. In a survey of organisations the following properties, in addition to others, were produced:

Number of employees
in the organisation: 20
21 - 100
101 - 500
501 - 1000
more than 1000

Computer Equipment: microcomputer
mini-computer
mainframe computer

These and the other properties produced refer to individual organisations. Each property can be produced for every arbitrary (ie. attainable) single organisation or group of organisations.

In the same way, arbitrary subsets of the basic entirety are attained by indicating certain manifestations. If by means of several properties, groups are formed through the indication of certain manifestations and the elements of every group are collected together, an aggregation exists. The formation of these groups must comprise all objects, which leads to disjoint subsets and the remaining ones which are not part of the properties within the aggregation must in some way or other be freshly calculated for the aggregates. When all the organisations in the above example are collected together according to the properties of the class of number of employees, then only 5 groups still exist. It is clear for the organisations of each group which quality proceeds from the aggregate, since this quality characterises them and all of the others must be determined anew, which under certain conditions is not always easy. However, in general, aggregation results from several properties. For example, on account of a multidimensional property structure, the aggregation could result simultaneously from the properties "class of number of employees" and "computer equipment." Then $5 * 3=15$ subsets arise, which are all indicated by a tupel of manifestations. It is generally valid: if one aggregates according to the properties U, V, W with k_u, k_v, k_w manifestations, then $k_u * k_v * k_w$ subsets arise, which are characterised by the respective n-tupel and the remaining properties must be calculated anew according to the aggregation.

This means that, for the retrieval of aggregated data, one can only extract according to those properties by which the aggregation was executed (selection properties). Possible additional properties which are of interest for the aggregates take on the character of target information, whose values, in relation to the subsets, which were formed by the "aggregation variables", can be questioned. While with an original multidimensional manifestation every property is in principal suitable for selection and for output, the properties here must be examined separately. This stipulation has generally already been made by the data producers (eg. the statistical bodies).

Summing up, it can be said that aggregated data are based on a multidimensional property structure, with a class formation according to a few properties, and that some other properties are calculated for these aggregates. This limited number of search properties is typical for the data structure and for the retrieval systems, which are at the present time available on the market from the hosts of numerical data. It also allows an appropriate coding of the databank elements which are partly available from the hosts (e.g. the keys in CRONOS, compare section 2). Moreover it makes it possible to store additional information about the individual elements (title etc.) quite easily. The allocation of the keys ensues so that the above cited classification of the respective class is coded numerically by the tupel of the manifestations, while each tupel is appointed a number. The only condition of the numbering is that it is unambiguous.

An important form of processed information, particularly in the field of econometric considerations are time series. The special feature of time series is that a property from the observation times exists in the multidimensional property structure. Indeed this property plays a central role because, normally, the counting out follows from it. Thereby, the manifestations of another property in relation to this one are issued. Under certain circumstances the property "time" plays, among other roles, the role of the selection property. From another somewhat narrower viewpoint, the stored data material is conceived as a bi-dimensional property. The time plays the role of the independent variable V and the changing size of the time-period becomes the dependent variable Y. The graphical presentation is based on this with the time axis. Of course more than one further observed property can exist in a multidemensional property structure in addition to the points of time. Leiner's definition is founded on this: "A time-series is formally seen an ordered set of observations (based on a time index) x_t of an exactly defined variable X_t." (LEINER 1982, p. 2; transl. by J.L.S.). Other authors satisfy themselves with very fuzzy definitions, like Chatfield, who, for example, describes a time series as being "a collection of data, which have been observed in a time-based sequence" (Chatfield 1982 p. 15, transl. by J.L.S.).

The time series provided in the framework of numerical data bases normally consists of aggregated values. To aggregate for example for a data base such as FRIC-CRONOS (foreign trade) one would form the time series from the multitude of data about the contracts made by individual firms (or about the customs papers) through summarising according to time periods (all data for one month), according to the "destination" (at home, overseas, which country), according to the "type" (purchase/sale) and according to other properties, which indicate the foreign trade of EC countries with one another and with partner countries in monthly amounts (see also figure 1.2/c). The "newly calculated" property is the monthly stream of trade between two countries.

Figure 1.2/c: Time-series

- Data of time-series are property-based informations with at least two properties, whereof one is the time of winnig the data.
- The data are ordered chronological. In most cases the intervalls are equidistant.
- A time-series is called continues if the data occur permanent, it is called discrete if data occur only at specific points of time.
- A time-serie is called deterministic if its development can be predicted exactly, it's stochastic if this can't be done.
- It often occurs that data of time-series are aggregated. That means: in addition to the property "time" other properties exist and the data have been combined using some of them.

For Example:

In the data base CRONOS-FRIC the data are aggregated according the properties (resp. their manifestations):

- Declaring Countries
- Trade flow
- Products
- Partner countries

New calculated for the aggregates: value (resp. quantity) of trade flows.

Therefore the time-series can be identified using a numerical key based only on this four properties.

Thereby it is possible to assign in a simple way supplementary properties to the time-series.

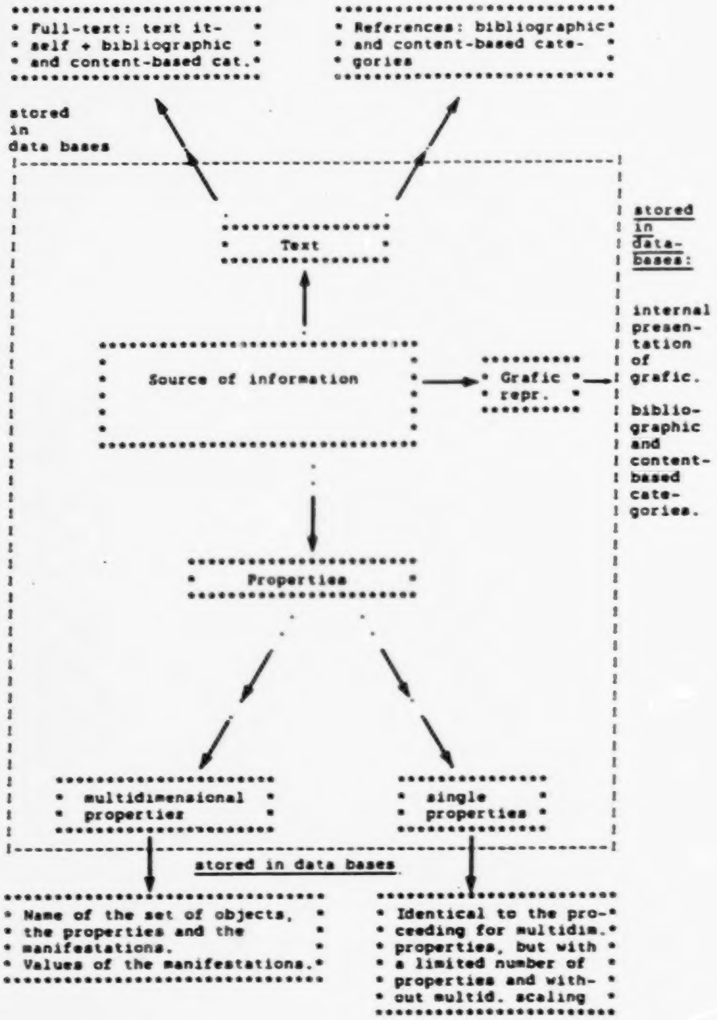
1.2.3 Types of information in today's online retrieval.

Figure 1.2/d summarizes an additional element which will enter into the building of the new classification. In the centre the expression "source of information" has been located. By this all things, situations, events, theories, etc., about which information exists, or about which information can be gained, are meant. Many different types of information will thereby occur (spoken or textual information, pre-structured information like properties, gestures, pictures, ...) but only three of them play a role in today's online retrieval:

- textual description
- properties-type information
- graphical representation

Textual information is best known in information retrieval. Properties form, as outlined in the last sections, a type of pre-structured information based on a measurement process and normally represented in tabular form. They are the second type, dominating types of information in today's online retrieval. Single and multidimensional properties must be differentiated and the scale-levels must be taken into consideration. Graphical representation will, in future, play a more and more important role in on-line retrieval. Not only because of the greater content of information in graphical representations, but also because the language barrier does not exist. Graphical representations in this context is not only thought of as graphical representation of retrieved data, but as retrieval with the help of graphics. A first step in this direction has been made in chemical databases. In these it is possible to search with parts of the structure formula, which means, the searcher gives a graphical representation or a part of it. The information searched can be another part of the graphical representation or other information, such as texts, properties, etc. Properties, as introduced in this section are the third of this dominating type of information in today's online retrieval. One can differentiate hereby multidimensional and single properties. These three types of information are grouped around the "source of information" - rectangle. Outside the greater rectangle including this one, the data stored in data bases are given, respectively to the three types. In the case of textual information, these are either fulltext or references (or both). In the case of properties, the name of the set of objects, of the properties and the manifestations must be given and (naturally!) the values of the manifestations. In the case of single properties, only a limited number of properties without multidimensional scaling exist. Graphical representations must be stored by an internal representation of the graphic information. Naturally also "references" to the graphical representation and the information represented by the graphic, like bibliographic and content-based categories can be stored.

Figure 1.2/d: The types of information in online-retrieval which dominate today


Full-text: text itself + bibliographic and content-based cat.
References: bibliographic and content-based categories
stored in data bases
stored in data-bases:
internal presentation of grafic.
bibliographic and content-based categories.
Text
Source of information
Grafic repr.
Properties
multidimensional properties
single properties
stored in data bases
Name of the set of objects, the properties and the manifestations. Values of the manifestations.
Identical to the proceeding for multidim. properties, but with a limited number of properties and without multid. scaling

"Type" of information	Retrieval with the aid of ...
full-text	... the text and the bibliographic and content-based categories.
textual facts	... the contents of the fields and the specification which information is hold.
single properties	... the manifestations.
multidimensional properties	... a combination of manifestations, resp. with the "output-properties" and the "selecting-properties".
grafic representation	... parts of the grafic representation and other descriptions of the information shown by the grafics.

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Figure 1.2/e shows some of the implications of this to online-retrieval in the several types of data bases (in accordance with the "new" classification). In full-text data bases, information retrieval will be executed with the aid of the text itself and some bibliographic and content-based categories. Textual facts will be searched by the contents of the fields and the specifications concerning which information is held in specific fields. Searching for single properties can be carried out with the values of the manifestations. In addition, retrieval of multidimensional properties needs a combination of manifestations, that is needs the "output-properties" and the "selecting-properties". Graphical representations need parts of the representation and other descriptions of the information shown by the graphics.

1.3 "Old" and "new" classification.

In Figure 1.2/e the "old" and the experimental new classification are compared. Bibliographic data bases have a similar position in both. As the distinction references/ sources does not play an important role in the "new" classification (every type can be a source data base or a reference data base, that is a data base with processed information) referral data bases can be found at different positions. Full-text data bases and properties data bases are similarly defined in both classifications. In the "new" classification, the data bases with textual facts and the statistical data bases can be differentiated. Also "graphical" data bases do not have an adequate opponent in the "old" classification.

Figure 1.2/e: "Old" versus "new" classification

"old" classification	"new" classification
Reference data bases	data bases with textual informations
- bibliographic data bases	- bibliographic data bases
- referral data bases	- full-text data bases
	data bases with textual facts
Source data bases	data bases with "properties-type information"
- full-text data bases	statistical data bases
- properties data bases	- with aggregate data
- textual numeric data bases	- with time-series
- numeric data bases	"grafical" data bases

2. Retrieval of property-type information

2.1 The Retrieval

The retrieval of property-type information with multidimensional properties requires two steps. With the first, certain objects will be selected by their specific manifestations. These properties shall be called selecting-properties. With the second step, the properties which shall be given for the selected objects can be fixed. They shall be called output-properties.

Normally groups (for comparison) have to be formed for statistical analysis. This happens in the same way with selecting-properties as will be described for one group - selection. All retrieval can be carried out by naming the manifestations of the concerned properties. Let U, V, W, ... be properties with k_u, k_v, k_w, ... manifestations and u_i ($i=1, \ldots, k_u$), v_i ($i=1, \ldots, k_v$), w_i ($i=1, \ldots, k_w$) the manifestations, respectively. The selection relating to a certain set of objects, in the case of one group, takes place by using the AND and OR operators:

AND-operator (only between the manifestations of different properties) :

$U=u_j$ AND $V=v_k$ AND $W=w_l$ ...

with $1 \leq i \leq k_u$; $1 \leq k \leq k_v$; $1 \leq l \leq k_w$

(elements which have simultaneously the properties u_j, v_k, w_l, ...)

OR-operator (between the manifestations of one property):

$U=u_j$ OR $U=u_k$ OR $U=u_l$ OR ...

with $j \neq k \neq l \ldots$ and $1 \leq j, k, l, \ldots \leq k_u$

OR-operator (between the manifestations of different properties),
for example:

$U=u_j$ OR $V=v_k$

Accordingly combinations of the operators can be used.

All these operations lead to one group. Comparative groups can be extracted by specifying the properties of every group (the properties of the groups are separated by a slash). For example:

$U=u_1$ OR $U=u_2$ AND $V=v_3$ / $U=u_2$ AND $V=v_2$

Normally the groups have to be disjunctive. In some cases another (shorter) form of retrieving such groups will be appropriate, for example: .

$U=u_1 \;/\; U=u_2 * V=v_1$ OR $V=v_2 \;/\; V=v_3 \;/\; V=v_4$

This will lead to six groups characterized by u_1 AND (v_1 OR v_2),
u_1 AND v_3, u_1 AND v_4, u_2 AND (v_1 OR v_2), u_2 AND v_3, u_2 AND v_4,
whose intersections are always empty.

If all manifestations of the properties are to be taken, only the naming of the properties is necessary:

$$U * V * W$$

With this first step the objects (the subset resp. subsets are selected). Now in the second step the output-properties for the groups or comparative group must be specified. This can be done by simply naming the properties

$$U, V, W, \ldots$$

If the manifestations of these properties shall be grouped together, this can be done with the OR-operator within the manifestations of the properties, for example:

$U=u_1$ OR $U=u_2 \;/\; U=u_3$
$V=v_1 \;/\; V=v_1$ OR $V=v_2$

In the simple case where information about all objects is wanted, step 1 is not necessary.

The result of such a retrieval process is a table similar to those shown in figure 1.2/b (raw data): For each of the selected objects one row exists, for every output-property a column. It can also be given as a frequency distribution. In this case, for all combinations of manifestations selecting- and output-properties will be given, how many elements fall under the combination. Let for example

$U=u_1 \;/\; U=u_2 \times V=v_1$ OR $V=v_2 \;/\; V=v_3$

be the selection-properties and W with w_1, w_2, w_3 the output-property, then the frequency distribution can be displayed in this way:

	u_1		u_2	
	v_1 OR v_2	v_3	v_1 OR v_2	v_3
w_1	a_1	a_2	a_3	a_4
w_2	a_5	a_6	a_7	a_8
w_3	a_9	a_{10}	a_{11}	a_{12}

There is no principal difference in the case of aggregate data. But, as outlined above, the only properties available for retrieval as selecting-properties are those which have formed the basis of aggregation. Accordingly, only the properties which were calculated for the aggregates can be used as output-properties. Often these are only a few. For example, in the data base CRONOSFRIC which will be examined later, the calculated values are only the values in ECU (or in tonnes, pieces) of the specific trade-flow at a certain time. In the case of time-series, it is also possible to "search" by the points of time.

The following explanations will be illustrated by examples. They come from online-retrieval with AREMOS (A Retrieval and Econometric Modelling System) in the CRONOS-data bases FRIC. AREMOS is the retrieval language of CISI (Compagnie International de Services en Informatique), a French host with subsidiaries in Great-Britain, the United States, Federal Republic of Germany and other countries. AREMOS can be used in four languages (French, English, German, Spanish). It allows retrieving of "statistical data", its tabular and graphical representation and statistical precessing (see for a more detailed overview the manual; see STAUD 1983 and STAUD 1984 for an introduction to the language and to the time-series analysis features). CRONOS is a data base complex produced by the statistical office of the European Community (EUROSTAT). One of the data bases included is FRIC, a data base concerned with international trade. The data in FRIC are all aggregated and time series.

2.2 Peculiarities

As outlined before, only a limited number of properties are necessary to retrieve from statistical data bases. In the case of FRIC there are only four. Figure 2.2/a shows these four properties (called subcodes) with some of their manifestations. These subcodes lead, with the numerical coded manifestations, to a nine-digit number, called the key. In the case of multidimensional properties every record (equivalent to time-series in this type of data base) can be related to such a key and the retrieval can be done by such keys. There is, therefore, a manual in which these keys are given, for every CRONOS-data base. The first property in the data base FRIC is the declaring country. These are the member-countries of the EC and in future some others such as the United States and Japan. The second property (subcode II) fixes the trade flow. Besides imports and exports in tonnes, etc. there are the manifestations imports and exports by value. Subcode III allows the choice of a certain product or product group. With the fourth property, (subcode IV), the partner countries (of the EC) can be selected and the key is completed. In the example of figure 2.2/a the declaring country FRG, the trade flow "exports by value", the product groups "total trade" and the partner country France have been chosen. This leads to the exports from the Federal Republic of Germany to France (=total trade) and to the key 127169001. In the terms of logical operators one can write:

"declaring country=12 AND trade flow=7 AND
products=169 AND partner country=001"

As already described above, the structure of aggregate data allows the relation of additional information to each time-series. In the case of FRIC these are fields like final date, starting point of the time-series and so on; in addition the key is held as such a field.

Figure 2.2/a: Information Retrieval in the case of properties
(example: data base CRONOS-FRIC)

```
Subcode I: declaring countries

        06: EUR-10
        12: FRG  *****************
        14: France                 *
             .                      *
             .                       *
             .                        *
                                       *
Subcode II: Trade Flow                  *
                                         *
             .                            *
             .                             *
             .                              *
        6: Imports by value                  *
        7: Exports by value  ****             *
             .                    *            *
             .                     *            *
             .                      *            *
                                     *            *
Subcode III: Products                 ****************** 127169001
                                      *               * (that is: exports
                                     *               * from FRG to France;
        169: Total trade  **********                *  total trade)
             .                                     *
             .                                    *
             .                                   *
        150: Food and live animals (SITC 0)     *
        151: Beverages and tobacco (SITC 1)    *
             .                                *
             .                               *
             .                              *
                                           *
Subcode IV: Partner Countries             *
                                         *
                                        *
        999: World                     *
        908: Intra-EC                 *
        909: Extra-EC                *
             .                      *
             .                     *
             .                    *
        001: France *************
        002: Belgium-Luxembourg
        003: The Netherlands          ********************************
        004: FRG                      * declaring country=12  AND    *
             .                        * trade flow=7 AND products=169*
             .                        * AND  partner country=001     *
             .                        ********************************
```

SITC: Standard International Trade Classification, Nomenclature, published by the Department of the Economic and Social Affairs, United Nations Statistical Office

Retrieval can be carried out with AREMOS, as described in the last section. At first the "set of objects" must be specified, that means the data base has to be chosen, for example one of the CRONOS-System. Then the time-series can be retrieved in two different ways: with the SELECT- and the EXTRACT-command. The second allows the retrieval of time-series only by the keys which have to be selected using a handbook, for example the CRONOS System manual. This method is not comfortable (no logical operators, only one time-series can be retrieved at a time) but fast and (therefore) cheap. And it is typical for this type of information. Less fast (and less cheap) is retrieval with the SELECT-command. This method follows the rules of the usual information retrieval with logical operators, building of subsets, and so on.

Figure 2.2/b gives an example of using the SELECT-command. With the command SPRache ENGlisch the language can be changed, (as German users we start in German; an English user will naturally start in English). PERIOD fixes the period for which the time-series are to be retrieved, also called INTERVAL. Then the SELECT-command is given and the data base FRIC chosen. With the SELECT-command a special mode (announced by line numbers) with a set of commands of its own is opened. The return to the normal level can be done with the input END. The list of commands (in the SELECT-mode) is also given in Figure 2.2/b, it can be produced by the input "?". In the first line of the search mode ALL time-series have been asked for. These are 69678 (in summer 1984). With the AND-operator and the specification TITLE = 'EXP' (the inverted commata indicate an alphanumeric string) 35388 time-series remain. The field TITLE is an alphanumeric field and this command produces a stringsearch in this field. Table 2.2/c shows some contents of the TITLE-field. With the input AND TITLE ='FRANCE' only the French exports remain. As cited above the input "?" produces the list of commands. Another "help-command" is FIELDS, this gives the list of the fields which exist to the time-series. The search is continued in Line 4 with the command COUNTRY = 10. But since no further operator was given a new set has been installed. 524 time-series have the entry 10 (that means, they deal with the European Community; compare also figure 2.2/c). In the same way with the OR-operator the time-series with the entries 102 (FRG), 106 (Italy) and 108 (the Netherlands) are added. All these are the so called "partner countries" (of the EC) and the code can be found in the country code, delivered by the host (further country codes are used, compare the annotations). In line 8 the first set (last modification in line 3) and the second are intersected. This leads to four time-series. With the command EXTRACT (in the SELECT-mode) the time-series are extracted, the parameter NAME allows us to give names to the time-series (default name would be a combination of data base name and key, for example FRIC047169001 for the time-series, which has here been named EC). Leaving the SELECT-mode produces the input END. Figure 2.2/c gives a second example of using the command SELECT. Here the search is carried out with the key (by using the key in the SELECT command it is also possible to make truncations). The point of these examples is to give an impression

Figure 2.2/b: The SELECT-command (underlined: the user's input)

```
                    A RETRIEVAL AND ECONOMETRIC MODELLING SYSTEM

                         VERSION 1.0            15 FEB 1984

                                   COPYRIGHT CISI

 EFEHL: SPR ENG

COMMAND: PERIOD 12 1960 1 TO 0

 OMMAND: SELECT FRIC

TITLE: FRENCH  ENGLISH GERMAN
CURRENT LANGAGE: ENGLISH
[1]  ALL

[1]  FOUND 69670 IN DATABANK FRIC
[2]  AND TITLE = 'EXP'

[2]  FOUND 35300 IN DATABANK FRIC
[3]  AND TITLE = 'FRANCE'

[3]  FOUND 26 IN DATABANK FRIC
[4]  ?

COMMANDS ARE:
BANK
FIELDS
EXTRACT
HISTORY
COUNT
BOUNDS
LANGUAGE
[4]  FIELDS

COUNTRY DEC      FD       FP       KEY      PER      PHAGE   SD       SP       TITLE
UN
[4]  COUNTRY = 10

[4]  FOUND 524 IN DATABANK FRIC
[5]  OR COUNTRY = 102

[5]  FOUND 7406 IN DATABANK FRIC
[6]  OR COUNTRY = 106

[6]  FOUND 14259 IN DATABANK FRIC
[7]  OR COUNTRY = 100

[7]  FOUND 21085 IN DATABANK FRIC
[8]  AND LINE 3

[8]  FOUND 4 IN DATABANK FRIC
[9]  EXTR NAME

047169801 : EU

027169801 : FRG

067169801 : IT

107169801 : NL

NUMBER OF EXTRACT SERIES: 4
[9]  END
```

Figure 2.2/c: The SELECT-command: stored information about the time-series

```
COMMAND: SELECT

DATABANK NAME: FRIC

TITLE: FRENCH  ENGLISH GERMAN
CURRENT LANGAGE: ENGLISH
[1]  KEY = 047169801

[1]  OR KEY = 147169900

[2]  FOUND 2 IN DATABANK FRIC

[3]  FIELDS

COUNTRY DEC      FD       FP       KEY      PER      PHASE   SD       SP       TITLE
UN
[3]  COUNTRY

     1:  10 EUR-9
     2: 104 FRANCE
[3]  COUNTRY, DEC, FD, FP, KEY

     1:  10 EUR-9          :          0:        78:          12:047169801
     2: 104 FRANCE         :          0:        84:           1:147169900
[3]  PER, PHASE, SD, SP, TITLE

     1:12:         1:        78:          1:EXP  FRANCE        GRAND TOTAL

     2:12:         1:        78:          1:EXP  INTRA-EC      GRAND TOTAL

[3]  UN

     1: 407  1000 ECU
     2: 407  1000 ECU
[3]  OR KEY = 147158900

[3]  FOUND 3 IN DATABANK FRIC
[4]  TITLE

     1:EXP   FRANCE        GRAND TOTAL
     2:EXP   INTRA-EC      FOOD AND LIVE ANIMALS
     3:EXP   INTRA-EC      GRAND TOTAL
[4]  OR KEY = 147161900

[5]  FOUND 4 IN DATABANK FRIC
[6]  TITLE

     1:EXP   FRANCE        GRAND TOTAL
     2:EXP   INTRA-EC      FOOD AND LIVE ANIMALS
     3:EXP   INTRA-EC      BEVERAGES AND TOBACCO
     4:EXP   INTRA-EC      GRAND TOTAL
[6]  OR KEY = 146157900
[6]  FOUND 5 IN DATABANK FRIC
[7]  TITLE

     1:EXP   FRANCE        GRAND TOTAL
     2:IMP   INTRA-EC      MINERAL FUELS ETC
     3:EXP   INTRA-EC      FOOD AND LIVE ANIMALS
     4:EXP   INTRA-EC      BEVERAGES AND TOBACCO
     5:EXP   INTRA-EC      GRAND TOTAL
[7]  END
```

of the fields which are additionally established for every time-series. As already outlined, the command FIELDS delivers the name of all fields for the specific data base (they differ for the different CRONOS data bases). An input of such a name (or of some of them) gives the content of the fields. In the example of figure 2.2/c at first the fields COUNTRY, DEC, FD (final date), FP (final point in the final date), KEY (key existing of 4 subcodes), PER (period: 12 = monthly, 4 = quarterly, etc), PHASE, SD (starting date), SP (starting point in starting date) are given. So, for example, the first time-series has the declaring "country" EUR-9 with the country code 10, it starts in January 1970 and ends in December 1978, the data are in monthly periods and its TITLE says that the time-series deals with the exports to FRANCE, all products included. The next lines show the search with the KEY (by the SELECT-command) and some contents of TITLE-fields. The field TITLE plays an important role. It gives information about trade flows, partner countries and products.

Annotation: Just as in "normal" information retrieval, retrieval in statistical data bases requires some aids besides the manuals. This is not a thesaurus but something similar, nomenclatures, and other codes. The first give information about some of the properties used and the coding of the manifestations: in the case of EUROSTAT bases:

- the Geonomenclature for the "partner countries" and for the data base COMEXT (2)
- the "country code", used in the field COUNTRY, delivered by the host
- the nomenclature NIMEXE (2) or SITC (4) to choose the products
- the manuals for the CRONOS-System. For every data base there is a manual which gives the Subcodes. The combination of these Subcodes leads to the key.

The CRONOS-manuals are delivered by the hosts. Unfortunately there are three different country-codings in use at time: the cited geonomenclature for the "partner countries" and for the data base COMEXT, a special code within the subcode "declaring countries" and another for the field COUNTRY (compare the examples in figure 2.2/c).

In figure 2.2/d an example is given of the EXTRACT-command. As described above, this command allows a fast and cheap access to time-series. After giving the command (EXTRACT) and the name of the database (FRIC), the system prompts with "KEY:" and allows the input the keys of the time-series with a name. The user ends the SELECT-mode by not giving the comma at the end of the line. Part two of the example in figure 2.2/d shows the use of the SELECT-command in the expert-mode. The command LIST, as shown in the figure, gives a list of all time-series retrieved at a specific time. These time-series are then available for tabular or graphical representation, for statistical processing, for simple calculating as shown in the last part of the figure. The command CALCULATE opens this mode by giving the double-point. As shown in the lower part of the figure, a long list of operators can be used in this example. Here the original time-series is divided by the exchange rate. The command CALCULATE will be explained in more detail in section 2.3 by demonstrating the possibilities of statistical processing.

Figure 2.2/d: Commands EXTRACT, LIST, CALCULATE

```
COMMAND: EXTRACT FRIC
KEYS: 407455900 'EXPS',
    : 406455900 'IMPS'
NUMBER OF EXTRACT SERIES: 2
COMMAND: EXTRACT FRIC 420000000 'DM'
NUMBER OF EXTRACT SERIES: 4
COMMAND: LIST
DM              FRG              IMPS            NL
EXPS            FRIC407455900 IT
COMMAND: CALCULATE
: A=FRG/DM
: B=NL/DM
: C=IT/DM
: END
```

A "first impression" of a time-series can be obtained by using the command DESCRIBE. As figure 2.2/e shows, this input delivers the series name, the date of last updating, the DESCRIPTION and the PERIODICITY with the INTERVAL. This gives important information about the time-series. In addition the input DESCRIBE VAL delivers some of the values of the time-series. The field description normally contains the name of the time-series, i.e. a combination of the data base name and the key like in the first two examples of figure 2.2/e, or the mathematical formula, if the series is the result of a calculation (see the third example).

Statistical data bases often contain only one type of numerical data. In the case of the CRONOS data bases these are always time-series. So the retrieval language AREMOS is designed to deal with time-series (and only with them). This allows the retrieval language to be simpler than if it had to manage different types of numerical data. For example in the case of tabular representation of the retrieved time series, if only time-series are presented, the creation of the table is very simple. The first column always holds the dates, in following columns the values of the time-series are arranged. Nevertheless the input for creating a table remains extensive, as figure 2.2/f shows. In the first part of figure 2.2/f, some new calculations are shown. The first leads to a percentage (imports as percentages of exports), the next changes the "thousand-DM" to "Million-DM". After another example of the LIST-command, the creation of a table is shown. This can be done with the command PRINT. The first input (and the only one for which no default-value exists) is the time-series which is to be represented in the table. As the name EXPRESSIONS indicates, expressions such as A + B, A/B + C, etc (A,B,C, = time-series) can be given. The input of a title, of column and spanning headings etc. leads to the table shown in figures 2.2/g and 2.2/h (see for details STAUD 1983, STAUD 1984 and the AREMOS-manual). That is the normal result of retrieval with property-type information in the case of time-series. In the next section an impression of the possibilities of statistical processing will be given and that leads to the more important results of statistical processed information.

Figure 2.2/e: DESCRIBing a time-series

```
COMMAND: DESCRIBE FRG

SERIES NAME: FRG
LAST UPDATED: THU 26 JUL 1984  15:52
DESCRIPTION: FRIC127169001
PERIODICITY AND INTERVAL: 12 1970 1 TO 1984 4

COMMAND: DESCR VAL FRG

SERIES NAME: FRG
LAST UPDATED: THU 26 JUL 1984  15:52
DESCRIPTION: FRIC127169001
PERIODICITY AND INTERVAL: 12 1970 1 TO 1984 4

DATE/VAL             DATE/VAL             DATE/VAL             DATE/VAL
----------------------------------------------------------------------------------
1980  5 1524146 :1981  5 1616897 :1982  5 2124583 :1983  5 1930000 :
1980  6 1558922 :1981  6 1662084 :1982  6 2400433 :1983  6 2343579 :
1980  7 1549639 :1981  7 1827334 :1982  7 1876550 :1983  7 1714324 :
1980  8 1864832 :1981  8 1309175 :1982  8 1682762 :1983  8 1400211 :
1980  9 1563992 :1981  9 1825656 :1982  9 2122077 :1983  9 2260936 :
1980 10 1692457 :1981 10 1985109 :1982 10 2077293 :1983 10 2069012 :
1980 11 1580047 :1981 11 1864740 :1982 11 2143003 :1983 11 2040031 :
1980 12 1560543 :1981 12 1840359 :1982 12 2207660 :1983 12 2176753 :
1981  1 1415707 :1982  1 1850413 :1983  1 1994242 :1984  1 2020004 :
1981  2 1576070 :1982  2 2144060 :1983  2 1904059 :1984  2 2533100 :
1981  3 1844926 :1982  3 2416479 :1983  3 2587630 :1984  3 2390001 :
1981  4 1890353 :1982  4 2174109 :1983  4 1877543 :1984  4 2122320 :

COMMAND: DESCR VAL A

SERIES NAME: A
LAST UPDATED: THU 26 JUL 1984  16:12
DESCRIPTION: FRG/DM
PERIODICITY AND INTERVAL: 12 1970 1 TO 1984 4

DATE/VAL               DATE/VAL               DATE/VAL               DATE/VAL
------------------------------------------------------------------------------------------
1980  5 3827752.7 :1981  5 4102425.1 :1982  5 5047706.1 :1983  5 4377397.0 :
1980  6 3900444.4 :1981  6 4209396.1 :1982  6 5490263.1 :1983  6 5320330.4 :
1980  7 3899964.3 :1981  7 4600266   :1982  7 4431002.6 :1983  7 3899142   :
1980  8 2693193.5 :1981  8 3296225.0 :1982  8 3970702.6 :1983  8 3390427.1 :
1980  9 3959062.6 :1981  9 4546220.1 :1982  9 4997992   :1983  9 5155794.1 :
1980 10 4313915.9 :1981 10 4047653   :1982 10 4004621.4 :1983 10 4664210.2 :
1980 11 3862667.3 :1981 11 4557250.7 :1982 11 5015459.5 :1983 11 4617912.6 :
1980 12 3996985.6 :1981 12 4521304.0 :1982 12 5202151.6 :1983 12 4917049.4 :
1981  1 3653447.1 :1982  1 4522022.3 :1983  1 4500137.2 :1984  1 4563072.1 :
1981  2 4076506.6 :1982  2 5239005.2 :1983  2 4547000.4 :1984  2 5605452.7 :
1981  3 4689564.1 :1982  3 5022462.7 :1983  3 5047702.9 :1984  3 5337515.3 :
1981  4 4815552   :1982  4 5200351.9 :1983  4 4237092.3 :1984  4 4737702.6 :
```

Figure 2.2/f: The commands CALCULATE, LIST. PRINTing a tabular

```
COMMAND: CAL
: X=(IMPS*100)/EXPS

: Y=IMPS/1000

: Z=EXPS/1000

: END


COMMAND: LIST

A               DM              FRIC107155900 NL            Z
B               EXPS            IMPS          X
C               FRG             IT            Y

COMMAND: PRINT

EXPRESSIONS: Y. Z. X

GENERAL OPERATORS:

TITLE: TRADE BETWEEN THE NETHERLANDS AND THE EC/IN CHEMICALS AND RELATED.

     :  PRODUCTS/(SITC 5)

GLOBAL FORMAT: 6 1 0

INDIVIDUAL FORMATS:

COLUMN HEADINGS: 1 'IMPORTS' 2 'EXP' 3 'PERC. EXP=100'

SPANNING HEADINGS: 1 2 'IN MIO DM' 3 '%'

FOOT-NOTE: SOURCE: EUROSTAT (FRIC) BY CISI WITH AREMOS

AVERAGE: 111

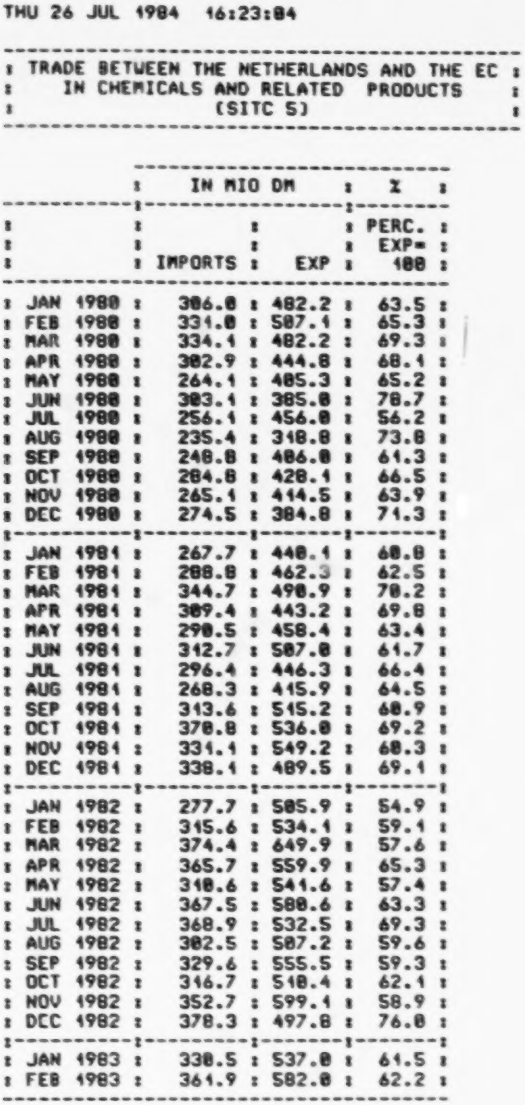
MINIMUM:

MARGIN:

DECORATION: EHVIUDX

POSITION THE PAPER
```

Figure 2.2/g: The tabular representation of time-series in AREMOS

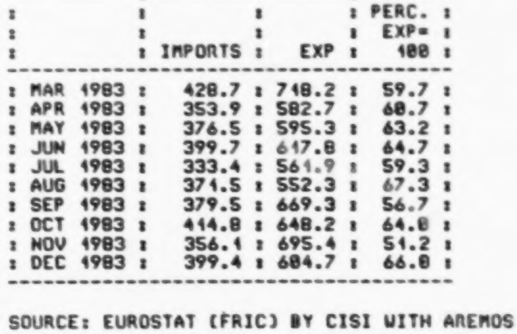


```
THU 26 JUL 1984  16:23:04

------------------------------------------------
: TRADE BETWEEN THE NETHERLANDS AND THE EC :
:    IN CHEMICALS AND RELATED  PRODUCTS    :
:                 (SITC 5)                 :
------------------------------------------------

             -------------------------------------
             :     IN MIO DM      :    %    :
-------------:--------------------:---------
:            :          :         : PERC.   :
:            :          :         :  EXP=   :
:            : IMPORTS  :    EXP  :   100   :
------------------------------------------------
: JAN 1980 :    306.0 : 482.2 :   63.5 :
: FEB 1980 :    331.0 : 507.1 :   65.3 :
: MAR 1980 :    334.1 : 482.2 :   69.3 :
: APR 1980 :    302.9 : 444.8 :   68.1 :
: MAY 1980 :    264.1 : 405.3 :   65.2 :
: JUN 1980 :    303.1 : 385.0 :   78.7 :
: JUL 1980 :    256.1 : 456.0 :   56.2 :
: AUG 1980 :    235.4 : 318.8 :   73.8 :
: SEP 1980 :    248.8 : 406.0 :   61.3 :
: OCT 1980 :    284.8 : 428.1 :   66.5 :
: NOV 1980 :    265.1 : 414.5 :   63.9 :
: DEC 1980 :    274.5 : 384.8 :   71.3 :
:----------:----------:-------:--------:
: JAN 1981 :    267.7 : 440.1 :   60.8 :
: FEB 1981 :    288.8 : 462.3 :   62.5 :
: MAR 1981 :    344.7 : 490.9 :   70.2 :
: APR 1981 :    309.4 : 443.2 :   69.8 :
: MAY 1981 :    290.5 : 458.4 :   63.4 :
: JUN 1981 :    312.7 : 507.0 :   61.7 :
: JUL 1981 :    296.4 : 446.3 :   66.4 :
: AUG 1981 :    268.3 : 415.9 :   64.5 :
: SEP 1981 :    313.6 : 515.2 :   60.9 :
: OCT 1981 :    370.8 : 536.0 :   69.2 :
: NOV 1981 :    331.1 : 549.2 :   60.3 :
: DEC 1981 :    338.1 : 489.5 :   69.1 :
:----------:----------:-------:--------:
: JAN 1982 :    277.7 : 505.9 :   54.9 :
: FEB 1982 :    315.6 : 534.1 :   59.1 :
: MAR 1982 :    374.4 : 649.9 :   57.6 :
: APR 1982 :    365.7 : 559.9 :   65.3 :
: MAY 1982 :    310.6 : 541.6 :   57.4 :
: JUN 1982 :    367.5 : 580.6 :   63.3 :
: JUL 1982 :    368.9 : 532.5 :   69.3 :
: AUG 1982 :    302.5 : 507.2 :   59.6 :
: SEP 1982 :    329.6 : 555.5 :   59.3 :
: OCT 1982 :    316.7 : 510.4 :   62.1 :
: NOV 1982 :    352.7 : 599.1 :   58.9 :
: DCC 1982 :    378.3 : 497.8 :   76.0 :
:----------:----------:-------:--------:
: JAN 1983 :    330.5 : 537.0 :   61.5 :
: FEB 1983 :    361.9 : 582.0 :   62.2 :
----------------------------------------
```

continuation of figure 2.2/g



```
             -------------------------------------
             :     IN MIO DM      :    %    :
-------------:--------------------:---------
:            :          :         : PERC.   :
:            :          :         :  EXP=   :
:            : IMPORTS  :    EXP  :   100   :
------------------------------------------------
: MAR 1983 :    420.7 : 718.2 :   59.7 :
: APR 1983 :    353.9 : 582.7 :   60.7 :
: MAY 1983 :    376.5 : 595.3 :   63.2 :
: JUN 1983 :    399.7 : 617.8 :   64.7 :
: JUL 1983 :    333.4 : 561.9 :   59.3 :
: AUG 1983 :    371.5 : 552.3 :   67.3 :
: SEP 1983 :    379.5 : 669.3 :   56.7 :
: OCT 1983 :    414.8 : 648.2 :   64.0 :
: NOV 1983 :    356.1 : 695.4 :   51.2 :
: DEC 1983 :    399.4 : 604.7 :   66.0 :
----------------------------------------

SOURCE: EUROSTAT (FRIC) BY CISI WITH AREMOS
```

2.3 Statistical processing

Statistical processing in AREMOS is mainly done with the help of the command CALCULATE. As shown above, it is possible to make the calculations with the usual algebraic operators in this mode. Some have already been introduced, a complete list of all operators comprises the first part of figure 2.3/a. As shown in this figure, one can receive this list by inputing a question mark. Besides the normal algebraic and logical operators, some others are available which come from statistical time-series analysis. Some will be explained here (for a detailed overview see the manual and STAUD 1984). One important method is to find trends in a time-series, for example, in linear form (compare for the methods the statistical literature, for example KENDALL 1973). Simply by using the operator TRENDLIN within the expression TR = TRENDLIN IMP5 a linear trend in relation to the time series IMP5 will be calculated. That means a new time series with the name TR, will be created, whose values represent a straight line adjusted to the values of IMP5. The same figure shows a simple form of graphical representation of time-series. More sophisticated forms can be used by using plotters, etc. The command to create such a simple plot on normal printers without using graphical options is PLOT. The only input for which no default value exists is the name of the time-series whose values shall be represented. Figure 2.3/a gives the result by using all defaults.

The statistical processing shown can be carried out within the command CALCULATE by using the algebraical, logical and statistical operators listed above. Further methods can be used by special commands. So for example for CORRELATIONs and REGRESSION analysis. Both are shown in the examples of figures 2.3/b to 2.3/f. Figure 2.3/b shows the simplicity of executing the correlation of two (or more) time-series. The same figure gives again an example of a graphical representation. The result of the command CORRELATION consists of the correlation matrix and the information about the common periodicity and interval of the two time-series. Figure 2.3/c shows the execution of a regression analysis in the conversational mode. After the input of the command name, AREMOS asks for the required parameters. As before, defaults exist for all parameters with the exception of the time-series input (EXPRESSION). Many different methods as indicated with the terms GENERALIZED Least Squares, INSTRUMENTAL VARIABLES, MAIN COMPONENTS and DISTRIBUTED LAGS can be used. In addition, the values of the endogeneous variables (observed and calculated) and the residuals can be printed out in graphical form. This is done here for the last ten or the last five values. The output of such a calculation consists of the correlation matrix and other information on the regression analysis, like the ENDOGENEOUS VARIABLE, the (common) PERIODICITY and INTERVAL, and so on. Figure 2.3/d gives the graphical output of the different values. After the execution of the command, two new entries are in the LIST of the time-series (see figure 2.3/e): OTTO and OTTOR. Figure2.3/e also gives the content of one of these "time-series", OTTO, and it shows one of the rare exceptions of the rule that a name in the LIST is always a time-series.

Figure 2.3/a: The list of operators within the CALCULATE-mode.
Grafical representation of time-series

```
COMMAND: CALC

: ?

OPERATOR LIST:
+         LT        NE        EXP       CUM       BASE      TREND     RATE
-         LE        AND       SIN       RTO       VDATE     TRENDLIN  PERIOD
*         EQ        OR        COS       ADIF      DIF       VDIF      DATE
/         GE        NOT       TAN       AMRATE    MEND      MAVG      DECUM
**        GT        LOG       ABS       ARATE     RATE      MRATE
: TR=TRENDLIN IMPS

: END

COMMAND: PLOT TR. IMPS

POSITION THE PAPER
```

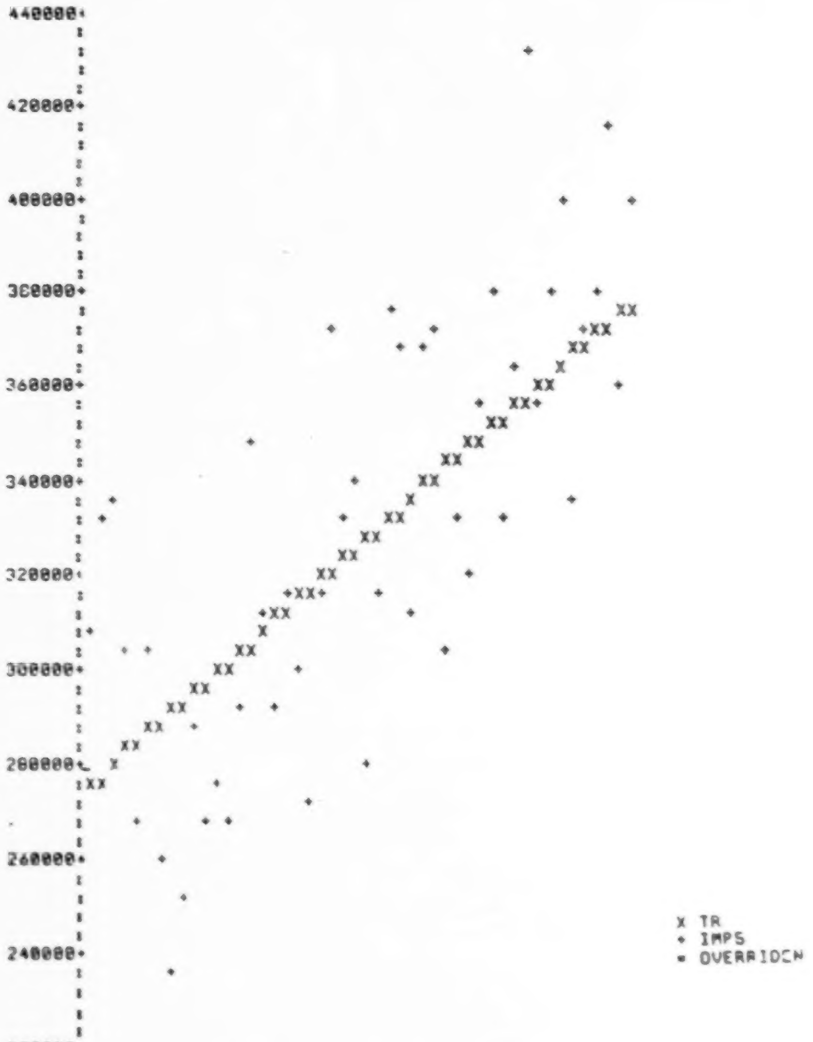
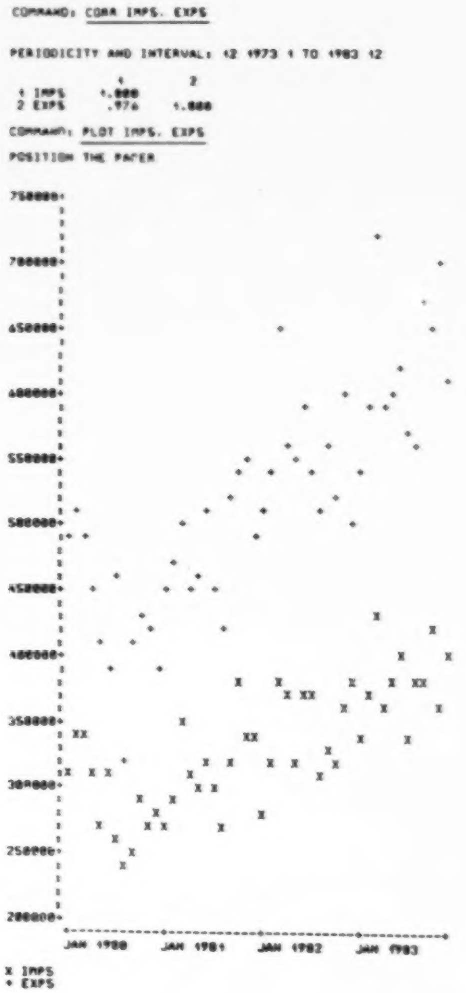


Figure 2.3/b: CORRELATION. Grafical representation with the PLOT-command



```
COMMAND: CORR IMPS, EXPS

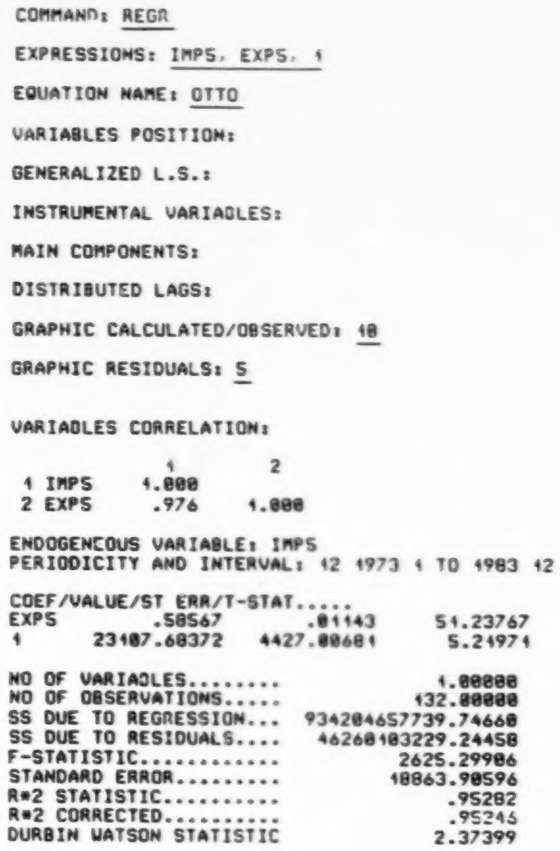
PERIODICITY AND INTERVAL: 12 1973 1 TO 1983 12

             1        2
 1 IMPS    1.000
 2 EXPS     .976    1.000

COMMAND: PLOT IMPS, EXPS

POSITION THE PAPER
```

Figure 2.3/c: REGRESSION-analysis: input and results



```
COMMAND: REGR

EXPRESSIONS: IMPS, EXPS, 1

EQUATION NAME: OTTO

VARIABLES POSITION:

GENERALIZED L.S.:

INSTRUMENTAL VARIABLES:

MAIN COMPONENTS:

DISTRIBUTED LAGS:

GRAPHIC CALCULATED/OBSERVED: 10

GRAPHIC RESIDUALS: 5


VARIABLES CORRELATION:

              1          2
 1 IMPS     1.000
 2 EXPS      .976      1.000

ENDOGENEOUS VARIABLE: IMPS
PERIODICITY AND INTERVAL: 12 1973 1 TO 1983 12

COEF/VALUE/ST ERR/T-STAT.....
EXPS          .58567          .01143      51.23767
1        23107.68372     4427.00681       5.21971

NO OF VARIABLES.........                  1.00000
NO OF OBSERVATIONS......                132.00000
SS DUE TO REGRESSION...  934204657739.74660
SS DUE TO RESIDUALS....   46260103229.24450
F-STATISTIC............              2625.29906
STANDARD ERROR.........             18863.90596
R*2 STATISTIC..........                  .95282
R*2 CORRECTED..........                  .95246
DURBIN WATSON STATISTIC                 2.37399
```

BEST COPY AVAILABLE

Figure 2.3/d: REGRESSION-analysis: further results (continuation of the results shown in figure 2.3./c)

```
GRAPHIC CALCULATED/OBSERVED:

---------------------------------
:           : OBSERVCD CALCULATED:
:   DATE    :   (*) E1    (X) E1 :
---------------------------------------------------------------------------------

: MAR 1983 :  42860.30  44375.43:                                        *     X:

: APR 1983 :  35385.10  36440.42:         *    X                                :

: MAY 1983 :  37645.50  37177.59:                 X *                           :

: JUN 1983 :  39974.60  38494.87:                      X     *                  :

: JUL 1983 :  33343.40  35216.67:*        X                                     :

: AUG 1983 :  37151.20  34654.84:     X           *                             :

: SEP 1983 :  37948.60  41511.56:                    *             X            :

: OCT 1983 :  41477.60  40273.31:                             X    *            :

: NOV 1983 :  35610.20  43030.36:         *                               X     :

: DEC 1983 :  39937.30  37725.95:                  X         *                  :
---------------------------------------------------------------------------------

GRAPHIC RESIDUALS:

------------------------------
:           : RESIDUA RES/OBS:
:   DATE    : (*) E3      E0 :
---------------------------------------------------------------------------------

: AUG 1983 :  24.964   6.719:                         :        *                :

: SEP 1983 : -35.630  -9.389:             *           :                         :

: OCT 1983 :  12.043   2.903:                         :   *                     :

: NOV 1983 : -74.282 -20.860:*                        :                         :

: DEC 1983 :  22.113   5.537:                         :       *                 :

---------------------------------------------------------------------------------
```

Figure 2.3/e: REGRESSION-analysis: the stored results

```
COMMAND: LIST

A             EXPS          GDN           OTTO          X
B             FRG           IMPS          OTTOR         Y
C             FRIC107155900 IT            TR            Z
DM            GD            NL            TRN

COMMAND: DESCR OTTO


EQUATION NAME: OTTO
LAST UPDATED: THU 26 JUL 1984  16:36
DESCRIPTION: IMPS,EXPS,1,PCAL 10  PRES 5  NAME OTTO

ENDOGENEOUS VARIABLE: IMPS
PERIODICITY AND INTERVAL: 12 1973 1 TO 1983 12

COEF/VALUE/ST ERR/T-STAT.....
EXPS         .58567       .01143     51.23767
1       23107.68372   4427.00681      5.21971

NO OF VARIADLES........            1.00000
NO OF OBSERVATIONS.....          132.00000
SS DUE TO REGRESSION... 934204657739.74660
SS DUE TO RESIDUALS....  46260103229.24458
F-STATISTIC............         2625.29906
STANDARD ERROR.........        18863.90596
R*2 STATISTIC..........             .95282
R*2 CORRECTED..........             .95246
DURBIN WATSON STATISTIC            2.37399

EQUATION: IMPS=(0.58567*EXPS)+(23108*1)
```

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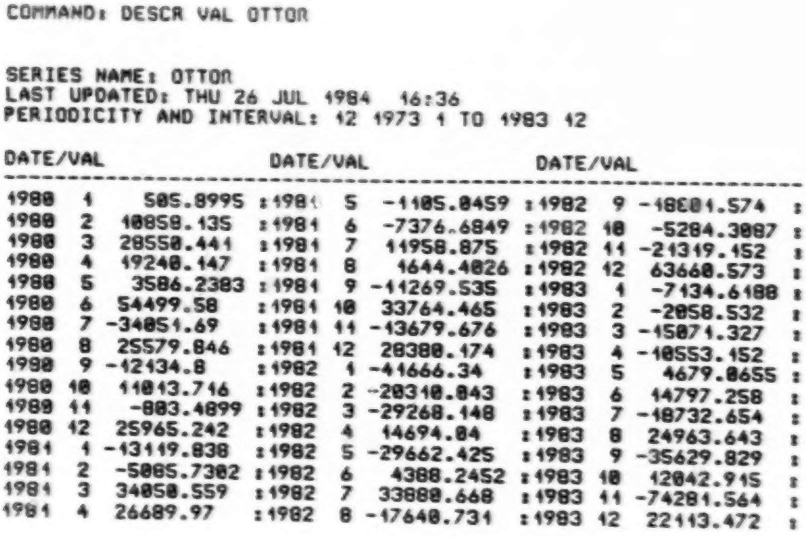
In this case, a file is created automatically with the name of the equation which contains the result of the calculation including the equation. With the name of the equation completed by an R, the residuals have been stored as a time-series. Both, the file which holds the results and that containing the residuals can be seen by using the command DESCRIBE (see also figure 2.3/f).

Figure 2.3/f: REGRESSION-analysis: the stored residuals



```
COMMAND: DESCR VAL OTTOR

SERIES NAME: OTTOR
LAST UPDATED: THU 26 JUL 1984  16:36
PERIODICITY AND INTERVAL: 12 1973 1 TO 1983 12

DATE/VAL                 DATE/VAL                 DATE/VAL
---------------------------------------------------------------------------
1980  1     505.8995 :1981  5  -1105.0459 :1982  9 -10801.574  :
1980  2   10858.135  :1981  6  -7376.6849 :1982 10  -5284.3087 :
1980  3   28550.441  :1981  7   11958.875 :1982 11 -21319.152  :
1980  4   19240.147  :1981  8   1644.4026 :1982 12  63660.573  :
1980  5    3586.2383 :1981  9 -11269.535  :1983  1  -7134.6188 :
1980  6   54499.58   :1981 10  33764.465  :1983  2  -2058.532  :
1980  7 -34051.69    :1981 11 -13679.676  :1983  3 -15071.327  :
1980  8   25579.846  :1981 12  28380.174  :1983  4 -10553.152  :
1980  9 -12134.8     :1982  1 -41666.34   :1983  5   4679.0655 :
1980 10   11013.716  :1982  2 -20310.043  :1983  6  14797.258  :
1980 11    -803.4899 :1982  3 -29268.148  :1983  7 -18732.654  :
1980 12   25965.242  :1982  4  14694.04   :1983  8  24963.643  :
1981  1 -13119.838   :1982  5 -29662.425  :1983  9 -35629.829  :
1981  2   -5005.7302 :1982  6   4388.2452 :1983 10  12042.915  :
1981  3   34050.559  :1982  7  33880.668  :1983 11 -74281.564  :
1981  4   26689.97   :1982  8 -17640.731  :1983 12  22113.472  :
```

Now some of the commands which can be used in AREMOS have been shown, i.e. some of the possibilities which offer an average retrieval language for statistical data bases. The full set of commands is shown in the lower part of figure 2.3/f. Summarizing, the following groups of commands are necessary to retrieve and manipulate this property-type information:

commands for:
- the retrieval of the data
- calculations
- tabular representations
- statistical representations
- statistical processing.

All these features must be available in a complete retrieval system for statistical data bases and they lead to the above mentioned peculiarities of this type of information retrieval.

2.4 Hosts

In the field of statistical data bases the following five hosts are of importance for the european user (compare also figure 2.4/a):

- I.P.Sharp
- ADP
- I/S Datacentralen
- CISI
- Bertelsmann Datenbankdienste GmbH

Since summer 1984 Bertelsmann, as a newcomer in this field, distributes the ADP data bases in the FRG, Austria and Switzerland. Some of the companies offering these data bases are great time-sharing companies with their own international data networks. Besides their other activities they also offer these statistical data bases for the public. Examples of this are I.P.Sharp, ADP, CISI.

Figure 2.4/a: Statistical data bases: the hosts

Name	Retrieval Language	Number of data bases
ADP (Automatic Data Processing, USA)	TSAM II (Time Series Analysis and Modelling)	approx. 30
I/S Datacentralen (Copenhagen, Denmark)	DC-TIME ("Time series management system")	more than 50, incl. CRONOS
I. P. Sharp (Canada)	MAGIC ("...for retrieval, manipulation, analysis and report formatting of timeseries and non time-series data.	approx. 120
CISI (Compagnie Internationale de Services en Informatique)	AREMOS (A Retrieval and Econometric Modelling System)	approx. 50, incl. CRONOS, COMEXT, STATISBUND
Bertelsmann Datenbankdienste GmbH	(distributes the ADP-data bases in Switzerland, Austria and the FRG)	

3. Online-retrieval with statistical data bases

The "peculiarities of numeric retrieval", which isthe subject of this paper refer to two different aspects, which although related, are on different levels. The first group of these peculiarities is to be found in the actual retrieval procedure. It arises from the type of information which is administrated here, namely from the simple and multi-dimensional properties and from the mathematical and statistical processing of the information to be searched for, which is possible in this area. The second group of peculiarities comes from the first group, especially from the latter part of it. In the area of the retrieval of properties' information and in the possible and meaningful further statistical processing of this information I see special educational requirements for the user of these systems. The application of statistical and econometric procedures demands knowledge which can only be offered by the expert. Even the expert will only be capable of mastering a few of these methods, namely those which are most useful to him. The obvious thought to separate the mastering of the procedures (practical steering of the statistical analyses) from the acquiring of (theoretical) knowledge of the methods makes no sense here, since both are too closely connected.

These processes require a know-how which goes beyond the customary knowledge-level of a librarian or archivist. Only a few librarians and archivists will for example, master the procedures of time-series statistics, not to mention the use of econometric models. On the other hand, I do not perceive any difficulties in the execution of normal retrieval in the sphere of property-type information. This should be well within the capability spectrum of the information services offered by the libraries.

Notes

(1) compare for example WANGER/LANDAU 1980

(2) Geonomenclature 1981 (annual publication), delivered by the Statistical Office of the European Community EUROSTAT and its sales offices (in the United Kingdom: H.M.Stationery Office, P.O. Box 569, London SE1 9NH, Tel. (01) 928 69 77. ext.365)

(3) NIMEXE is published in the Official Journal of the European Communities.

(4) The text of SITC is published by the Department of the Economic and Social Affairs - United Nations Statistical Office - under "Statistical Papers, Series M, No 34"

References

CHATFIELD, C. Analyse von Zeitreihen. Eine Einführung. München, 1982.

CUBILLAS, M.M. Nonbibliographic databases in a corporate health, safety and environment organization. Special Libraries, vol. 72 (1981) no. 3, pp. 243-248.

FRIED, J.B., LUEDKE, J.A. & RUBIN, S.A. Online numeric database systems. ONLINE, vol. 1 (1977) no. 3, pp. 70-72.

KENDALL, M.G. Time-Series. London, 1973.

LEINER, B. Einführung in die Zeitreihenanalyse. München, Wien, 1982.

LUEDKE, J.A. Numeric databases on-line. Online Review, vol.1 (1977) no. 3, pp. 207-215.

PFANZAGL, J. Theory of measurement. Würzburg, Wien, 1971.

RUSCH, P.F. Introduction to chemical information storage and retrieval. Journal of Chemical Education, vol. 58 (1981) no. 4, pp. 337-342.

STAUD, J.L. Extrahieren und Verarbeiten numerischer Fakten in Retrievalsystemen. Am Beispiel AREMOS. Universität Konstanz, 1983. (Informationswissenschaft, Bericht 3/83).

STAUD, J.L. Statistische Verarbeitung von Informationen in Faktenretrievalsystemen. Am Beispiel der Zeitreihenstatistik in AREMOS. Universität Konstanz, 1984. (Informationswissenschaft, Bericht 1/84).

WANGER, J. & LANDAU, R.N. Nonbibliographic On-line Data Base Services. Journal of the American Society for Information Science, vol. 31 (1980) no. 3, pp. 171-180.

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REF-ED: A SYSTEM FOR PRODUCTION OF REFERENCE LISTS IN MANUSCRIPTS ALLOWING DOWNLOADING FROM LARGE DATABASES

There are today several excellent systems available for information retrieval of bibliographic references using large computer systems. While many existing systems are very powerful tools in the hands of educated specialists for searching in large databases, very few can assist in the production of manuscripts. The usual result of a database search is a printout with a list of references. In the highly likely event that the scientist who ordered the computer search is going to use at least some of the references in the production of a manuscript, the information has to be retyped manually.

REF-ED is a system of programs for microcomputer systems, developed by BIOSOFT Sweden, for the solution of these problems. It is a database system for the individual investigator allowing easy automatic restyling of the bibliographic information. The format specifications may be tailored by the user to suit almost any reference style.

The REF-ED system may be used for the organization of a personal reference bank and as a complement to wordprocessing. It includes powerful editing functions, and the search functions, allow string searching of all fields and a combination of search words with AND/OR. Special keywords may also be assigned to facilitate retrieval.

The most interesting feature of this program, however, is the possibility of downloading references from certain very large databases with bibliographic information. The first implementation was on the ELHILL system by NLM, Washington DC, with MEDLINE, which covers about 4000 medical journals, as the most prominent base. An interactive user connected with his microcomputer may search the large database and save the found references locally. Off-line, a special program converts the printout from e.g. MEDLINE to the internal database format allowing local search and automatic reformatting. This conversion also performs certain steps necessary for the later production of manuscripts, such as adding periods to indicate abbreviated journal names, converting upper-case characters to lower-case and vice versa.

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